Salud, Ciencia y Tecnología - Serie de Conferencias. 2025; 4:1748
doi: 10.56294/sctconf20251748

ORIGINAL

AI in the university: ethical and strategic diagnosis for a responsible integration in higher education

IA en la universidad: diagnóstico ético y estratégico para una integración responsable en la educación superior

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Cite as: Matehu Espinosa FX, Arguello Maya EO, Chávez González MM, Arias Cevallos KP, Montero Reyes Y. AI in the university: ethical and strategic diagnosis for a responsible integration in higher education. Salud, Ciencia y Tecnología - Serie de Conferencias. 2025; 4:1748. https://doi.org/10.56294/sctconf20251748

Submitted: 18-07-2025 **Revised:** 24-09-2025 **Accepted:** 02-12-2025 **Published:** 03-12-2025

Editor: Dr. William Castillo-González

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ABSTRACT

The rapid emergence of artificial intelligence (AI), particularly generative AI, is reshaping study practices in higher education, offering opportunities for pedagogical innovation while also raising ethical dilemmas, regulatory tensions, and academic risks. In Ecuador, the institutional integration of AI remains incipient and uneven, making contextualized assessments essential for guiding responsible decision-making. This study evaluates, from an ethical and strategic perspective, the use, perceptions, and AI literacy of students from Universidad Técnica de Cotopaxi (UTC) and Universidad de las Fuerzas Armadas ESPE (Latacunga campus) as a basis for proposing guidelines for responsible integration of AI in higher education. A quantitative, non-experimental, cross-sectional, and comparative design was applied to an intentional sample of 400 students using a validated five-point Likert-type questionnaire (global α > ,80) measuring five dimensions: academic use, perceived benefits, ethical risks, perceived literacy and institutional governance, and willingness toward responsible integration. Findings reveal frequent use of AI for information retrieval, writing support, and comprehension of academic content, alongside a generally positive valuation of AI as a learning resource. However, students also express concerns regarding plagiarism, reduced critical-thinking skills, algorithmic biases, and the absence of clear institutional policies. Significant differences were observed between universities in declared AI literacy and awareness of governance frameworks, with ESPE reporting slightly higher levels. Despite these variations, both groups show strong willingness to receive training and engage in responsible AI integration initiatives. Overall, the study concludes that while AI is already embedded in students' academic routines, ethical and pedagogical governance remains underdeveloped, highlighting the need for explicit institutional policies, critical AI literacy programs, and participatory mechanisms to support responsible integration in Ecuadorian higher education.

Keywords: Artificial Intelligence; Higher Education; Ethics.

RESUMEN

La irrupción acelerada de la inteligencia artificial (IA), en particular la IA generativa, está transformando las prácticas de estudio en la educación superior, abriendo oportunidades de innovación pedagógica pero también generando dilemas éticos, tensiones normativas y riesgos académicos. En Ecuador, la integración institucional de estas tecnologías es aún incipiente y desigual, lo que hace necesario desarrollar diagnósticos contextualizados que orienten decisiones responsables. Este estudio evalúa, desde una perspectiva ética y

estratégica, el uso, las percepciones y la alfabetización en IA de estudiantes de la Universidad Técnica de Cotopaxi (UTC) y de la Universidad de las Fuerzas Armadas ESPE (sede Latacunga), con el fin de proponer lineamientos para una integración responsable de la IA en la educación superior. Se empleó un enfoque cuantitativo, no experimental, transversal y comparativo con una muestra intencional de 400 estudiantes, mediante un cuestionario tipo Likert de cinco puntos validado por juicio de expertos y pilotaje (α global > 0,80), que evaluó cinco dimensiones: uso académico de IA, beneficios percibidos, riesgos y dilemas éticos, alfabetización y gobernanza institucional percibidas, y disposición hacia una integración responsable. Los resultados muestran un uso frecuente de IA para la búsqueda de información, el apoyo a la escritura y la comprensión de contenidos, junto con una valoración positiva de su utilidad académica. No obstante, persisten preocupaciones por el plagio, la pérdida de habilidades críticas, los sesgos algorítmicos y la ausencia de lineamientos institucionales claros. Se identificaron diferencias significativas entre universidades respecto a la alfabetización declarada y al conocimiento normativo, con ligera ventaja para la ESPE, aunque en ambos casos existe alta disposición a recibir formación específica. En conjunto, se concluye que la IA ya forma parte del quehacer estudiantil, pero la gobernanza ética y pedagógica se mantiene en una fase inicial, lo que exige políticas institucionales explícitas, alfabetización crítica y mecanismos participativos para su integración responsable.

Palabras clave: Inteligencia Artificial; Educación Superior; Ética.

INTRODUCTION

In recent years, artificial intelligence (AI), especially in its generative form, has burst onto the scene with unprecedented force in higher education, changing study practices, forms of research, and modes of academic interaction. Its ability to generate text, images, conceptual explanations, or computer code has reconfigured learning times, academic writing, and students' relationship with knowledge. This transformation is not neutral: it opens up possibilities for personalization, autonomy, and creativity, but it also creates ethical, academic, and pedagogical tensions that need to be understood from a contextualized and critical perspective.[1,2] International organizations such as [3] warn that the responsible use of AI requires regulatory and training frameworks based on transparency, equity, human supervision, privacy, and social responsibility, principles that today constitute the ethical basis for its implementation in universities.

Within this global scenario, the concept of AI literacy takes on special relevance, understood as a set of cognitive, technical, critical, and ethical skills that enable students to understand the fundamentals of AI, identify its limitations, assess risks, and make informed decisions in academic contexts.[4,5] In Ecuador, this process is in its early stages: although students make intensive use of generative AI technologies, most institutions do not yet have specific policies, ethical guidelines, or structured advanced digital training programs in place.[6] This gap between everyday use and incipient institutional governance is an issue that needs to be studied urgently, as it directly influences academic integrity, the quality of learning, and civic education.

In this context, the reality of the Technical University of Cotopaxi (UTC) and the University of the Armed Forces ESPE - Latacunga Campus offers a valuable case study for understanding the current challenges of AI in Ecuadorian higher education. Both institutions, located in the Sierra region of the country, serve diverse populations that include students from rural areas, peripheral urban sectors, indigenous communities, and young people whose educational trajectories have been shaped in environments with unequal access to technology. Although both universities report intensive use of AI among their students, they do so under very different conditions: UTC faces greater limitations in terms of digital infrastructure, access to devices, and stable connectivity, while ESPE has more technological resources and a tradition in engineering fields. These differences allow us to observe not only heterogeneous practices of use, but also contrasts in digital literacy, ethical perceptions, and institutional capacities to guide the responsible use of AI. Studying this contrast constitutes a significant contribution to understanding how structural gaps condition the way AI is integrated into learning processes in Latin American contexts.

The scientific novelty of this article lies precisely in its integrated and comparative approach. Unlike the studies available in Ecuador, which focus mainly on general perceptions or theoretical analysis, this work combines in a single design: (a) the measurement of the actual use of AI in academic tasks, (b) the analysis of perceived risks and ethical dilemmas, (c) the assessment of the level of AI literacy and declared institutional governance, and (d) the comparison between two institutions with different socio-educational profiles. This approach offers a more comprehensive and contextualized view of how AI is appropriated in contexts where regulatory frameworks have not yet been consolidated, providing empirical evidence that has not been documented in the country until now. In addition, the study integrates an ethical-strategic perspective that allows for the identification of tensions between student autonomy, academic integrity, and institutional

responsibility, an approach that has been scarcely explored in recent Latin American research.

The relevance of this study is based on the urgency of understanding how AI is transforming university learning and what institutional capacities are necessary to ensure responsible adoption. In the absence of clear guidelines, students are forced to navigate complex decisions related to plagiarism, authorship, technological dependence, information accuracy, and algorithmic biases on their own. At the same time, universities face increasing pressure to update their pedagogical models, revise their assessment criteria, and strengthen the digital skills of their academic community. This article provides concrete evidence for designing institutional policies, critical AI literacy programs, and governance strategies consistent with contemporary technological challenges.

Finally, the problem statement that guides this study is expressed in the following question: How are university students using AI, and what ethical dilemmas, educational risks, and literacy gaps emerge in institutional contexts where clear policies for responsible integration do not yet exist?

General objective

To evaluate, from an ethical and strategic perspective, the use, perceptions, and AI literacy of students at UTC and ESPE (Latacunga campus), as input for the design of policies and strategies for the responsible integration of AI in higher education.

Specific objectives

1. To describe patterns of academic use of AI tools among students at both universities.
2. Analyze perceptions of the benefits, risks, and ethical dilemmas associated with the use of AI in the university setting.
3. Compare the level of literacy and knowledge of institutional guidelines on AI at the two institutions studied.
4. Propose ethical and strategic guidelines for the responsible integration of AI in public universities in the Ecuadorian highlands.

State of the art

The emergence of artificial intelligence (AI), and in particular generative AI, in higher education has led to a growing number of studies analyzing its uses, benefits, risks, literacy levels, and forms of institutional governance. This state of the art is organized around the main variables of the study: student usage patterns, perceptions of ethical benefits and risks, AI literacy, and institutional policies and guidelines, with a special focus on contributions in Latin America and, where possible, in Ecuador.

The first systematic studies on the use of generative AI among university students show rapid and widespread adoption, albeit heterogeneous.[7] In a survey of 399 students in Hong Kong, they describe a pattern of use focused on information search, writing support, and idea generation, with mostly positive attitudes toward the integration of tools such as ChatGPT in learning, but with significant variation depending on discipline and previous experience.

Subsequent research in European contexts confirms this picture. [8], in a study of 737 students at a Spanish university, identifies three main groups: intensive ChatGPT users, moderate users, and non-users, and shows that systematic academic use is concentrated among those who already had greater digital familiarity and prior academic capital. These findings are consistent with the "bottom-up" adoption pattern observed in your study, where AI is integrated into study routines even when universities have not yet defined clear policies.

In Latin America, [9] analyze the perceptions of students from three countries and describe widespread use of AI to organize work, clarify concepts, and prepare for assessments, although with significant differences depending on access to technological resources and institutional offerings of AI training. More specifically, for Ecuador, [10] study 56 university students of academic writing in English and show that the use of generative AI is mainly oriented towards reformulation, linguistic revision, and idea search, with a constant tension between didactic support and fear of dependence.

Overall, these studies agree that AI has become normalized as a study aid, but with varying degrees of intensity and purpose, which is consistent with the differences observed in your research between UTC (more intensive and homogeneous use) and ESPE (more heterogeneous appropriation). In terms of perceived benefits, the literature converges in pointing out that students value AI as a tool for saving time, clarifying complex content, structuring texts, and enhancing creativity. [11] highlight that participants attribute a key role to AI in personalizing learning and supporting writing, but emphasize that this potential depends on critical and guided use.

Similarly, [12] shows that frequent users of ChatGPT report perceived improvements in performance and self-confidence, which explains the rapid expansion of these tools in university contexts. However, these benefits are accompanied by risks and ethical dilemmas related to academic integrity, the reliability of information, and

evaluative justice. In the study by [13], a relevant finding is that Ecuadorian students are less concerned about "being caught" in the event of misuse and more concerned about the danger of AI weakening their own writing and critical thinking skills.

This nuance reinforces the idea that the main risk is not only fraud, but the replacement of fundamental educational processes. At the regional level, [14] and [15] agree that AI opens up opportunities to improve educational quality and personalize learning, but they highlight risks linked to the digital divide, algorithmic opacity, the concentration of technological power, and the lack of clear policies in Latin American universities.

These works dialogue with your study by showing that, even when the perception of benefits is high, students identify gray areas in institutional regulation and call for more explicit guidance on permitted uses, ethical limits, and consequences of inappropriate use. The relationship between generative AI and academic integrity has become a central focus of the debate. Several studies document institutions' concerns about AI-assisted plagiarism and the difficulty of distinguishing between human and assisted production. [16] shows that, although a minority acknowledge having used AI for tasks that border on academic fraud, many students operate in a "gray area" where it is unclear whether certain forms of assistance are acceptable or not.

In response, research on university policies highlights the emergence of specific governance frameworks. [17], in a study of the top 100 universities in the United States, conclude that most have adopted an "open but cautious" stance: the inevitability of AI is recognized, its pedagogical use in certain contexts is promoted, and transparency, data protection, and academic integrity are simultaneously emphasized.

Complementarily, [18] analyze global policies and point out that universities tend to combine pedagogical guidelines, specific clauses on AI in codes of honor, and training resources for faculty, although with great variability in clarity, scope, and rigor. In Latin America, [19] study 665 university teachers and show that the integration of AI is experienced as a process fraught with ethical challenges, regulatory uncertainty, and a lack of training, both among teachers and students.

Their study describes a scenario in which institutions react late, creating a gap between actual practices and regulatory frameworks, a situation very similar to that reported by students at UTC and ESPE when they perceive guidelines to be "biased" or "unclear." This research is part of this shift towards AI governance, providing a comparative diagnosis from the student perspective at two public universities in the Ecuadorian Sierra, where widespread normalised use is combined with a clear demand for explicit rules, training and support.

The notion of AI literacy has gained prominence in recent years, understood as a set of knowledge, skills, and critical dispositions that enable an understanding of what AI is, how it works, what its biases are, and what impacts it has on social and professional life. [20] conducts a comprehensive review of critical AI literacy and proposes frameworks that integrate technical, ethical, and sociopolitical dimensions, insisting that higher education must go beyond instrumental use toward critical and reflective understanding.

Along the same lines, different teams have developed and validated measurement scales. [21] proposes a systematic approach to building AI literacy instruments in higher education, emphasizing the need to capture not only operational skills, but also conceptual understanding and critical attitudes. [22], in Indonesia, identify four dimensions: awareness, use, evaluation, and ethics; they find that literacy levels vary significantly according to gender, age, and access to devices, which highlights internal gaps even within the same institution.

For their part, [23] develop the SAIL4ALL scale, designed to measure AI literacy in the adult population, and show that many users report high familiarity but limited knowledge about the functioning, biases, and limitations of AI. This pattern of predominantly instrumental competence coincides with what was observed in your study: most UTC and ESPE students report knowing and using AI tools, but difficulties persist in understanding their professional impact, ethical risks, and the meaning of institutional policies.

In the Latin American context, [24] on student perceptions confirm that AI literacy focuses on "knowing how to use" and not necessarily on "knowing how to evaluate" or "knowing how to deliberate," which limits students' ability to participate in informed debates on AI regulation at their universities.

AI in Latin American universities: gaps, opportunities, and challenges

Specific studies on AI in Latin American universities highlight a picture of accelerated but uneven adoption. [25] show that faculty perceive AI as a vector of innovation, but also as a source of ethical uncertainty, work overload, and pressure to update their skills without adequate institutional support.

Complementarily, studies such as those by [26] emphasize that AI is inserted into systems already marked by digital divides, socioeconomic inequalities, and university structures with very disparate capacities to invest in infrastructure, training, and governance policies.

In this context, your study contributes scientific novelty by focusing on two public universities in the Ecuadorian Sierra region, comparing patterns of use, ethical perceptions, and levels of AI literacy. Unlike other studies that address multinational samples or focus on a single country, here it is shown that even within the same national territory there are divergent institutional trajectories: UTC appears to have more intensive use

and a more visible training offer in AI, while ESPE shows a more heterogeneous appropriation, with segments lagging behind and, at the same time, with nuclei of critical sensitivity to the lack of clear guidelines. This evidence reinforces the thesis that the integration of AI into Latin American higher education is neither linear nor homogeneous, but stratified by institutional cultures, student profiles, and university policy decisions.

METHOD

The study takes a quantitative approach, given that its central purpose is to measure observable patterns of behavior, perceptions, AI literacy, and ethical assessment using numerical indicators that can be statistically analyzed. This approach allows for an accurate description of the magnitude and variability of the phenomenon, while enabling systematic comparison between two independent groups. The choice of a quantitative approach responds to the need to generate an objective and replicable diagnosis, suitable for contexts where institutions require empirical evidence for strategic decision-making and policy formulation on the ethical use of artificial intelligence in higher education.

The research was conducted in a non-experimental manner, since the independent variables were not deliberately manipulated and the conditions of the groups were not altered. In this sense, we worked with natural situations as they occur in the university environment, allowing us to observe the phenomenon in its real complexity. The non-experimental nature is consistent with diagnostic studies that seek to characterize a state, identify relationships, and detect existing gaps without altering student behavior. This modality ensures respect for the integrity of the educational context and reduces threats to internal validity resulting from artificial manipulations.

The study also adopted a cross-sectional design, which is characterized by collecting data at a single point in time. This methodological choice is appropriate for exploring emerging phenomena—such as the integration of generative AI into student practices—whose dynamics need to be understood at a specific point in time, especially in a field where technological changes occur at an accelerated pace. The cross-sectional design allows perceptions, uses, and literacy levels to be captured simultaneously, revealing trends current at the time of the study. While it does not allow causality to be established, it provides an accurate snapshot of the phenomenon at a key moment for Ecuadorian universities, which are in the process of formulating internal regulations.

Likewise, a descriptive-comparative approach was used, with the aim of detailing the characteristics of the phenomenon and contrasting the differences between two institutions with different profiles and technological contexts: the Technical University of Cotopaxi (UTC) and the University of the Armed Forces ESPE (Latacunga campus). The descriptive component allowed us to characterize the levels of academic use of AI, the perceived benefits and risks, the declared literacy, and the ethical assessment of the student body. For its part, the comparative component made it possible to examine similarities and differences between the two universities, generating empirical evidence on how institutional gaps in infrastructure, technological training, or internal regulations can influence student behavior towards AI.

The combination of these methodological elements—quantitative approach, non-experimental modality, cross-sectional design, and descriptive-comparative scope—responds to the need to construct a robust and contextualized diagnosis of the integration of AI in Ecuadorian higher education. This design allows us to identify emerging patterns, formulate hypotheses for future research, and offer relevant inputs for the construction of institutional governance frameworks and ethical guidelines applicable in the Sierra region of Ecuador. In this way, the selected methodology guarantees both scientific rigor and contextual relevance, ensuring that the results can guide institutional decisions in an environment where universities face unprecedented challenges arising from the accelerated incorporation of intelligent technologies.

The target population of the study consisted of students enrolled in undergraduate programs at two public universities in the Sierra region of Ecuador: the Technical University of Cotopaxi (UTC) and the University of the Armed Forces ESPE – Latacunga campus. Both institutions represent contrasting educational realities that enrich the analysis. The UTC mainly serves students from rural areas, indigenous communities, and low- and middle-income families, which is reflected in more limited access to technology and educational trajectories marked by structural inequalities. For its part, ESPE is characterized by an institutional tradition in engineering and applied sciences, with a more consolidated technological infrastructure and students with greater prior exposure to digital environments. This diversity of profiles allowed for a robust comparative diagnosis of AI literacy and ethical perceptions in heterogeneous socio-educational contexts.

The sample consisted of 400 students selected through purposive sampling, with the aim of incorporating participants who met criteria relevant to the study's objectives. Two hundred students were included per university, ensuring balance between the groups to facilitate statistical comparisons. The inclusion criteria considered: (a) being over 18 years of age, (b) being enrolled in the semester of application, (c) having used an AI tool—general or generative—at least once in the last year for academic purposes, and (d) having voluntarily agreed to participate through informed consent. The latter criterion was essential to comply with the ethical

principles of human research. Questionnaires with more than 20 % missing data and those with invalid response patterns were excluded to ensure the quality of the database and the reliability of the analyses.

Instrument

The data collection instrument consisted of a structured questionnaire designed specifically for this study, based on a comprehensive review of the literature on artificial intelligence literacy, attitudes toward AI in higher education, algorithmic ethics, and international technology governance frameworks.[27] The construction of the instrument combined widely validated theoretical references with elements contextualized to the Ecuadorian university system, recognizing the importance of adapting instruments to local realities to improve their ecological validity.

The questionnaire was organized into five conceptual dimensions:

1. Academic use of AI, which assessed the frequency with which students use AI tools for information search, content comprehension, writing, programming, and assessment support.
2. Perceived benefits, referring to students' assessment of the usefulness, efficiency, creativity, and educational support provided by AI.
3. Ethical risks and dilemmas, which explored perceptions of plagiarism, loss of critical skills, algorithmic biases, data privacy, and equity.
4. Perceived literacy and institutional governance, which explored stated knowledge about how AI works, as well as perceptions of existing institutional regulations, rules, and guidelines.
5. Willingness toward responsible integration, which assessed students' openness to training, participating in governance processes, and adopting ethical guidelines.

Content validity was assessed through expert judgment, where five specialists—three in higher education and two in technological ethics—reviewed the relevance, clarity, and consistency of each item. Adjustments were made to wording, sequencing, and redundancy based on their recommendations. Subsequently, a pilot study was implemented with 40 students with characteristics similar to the target sample, which allowed for the evaluation of linguistic comprehension, response times, and interpretive consistency of the items. The observations derived from the pilot study led to final adjustments to the instrument.

Internal reliability was estimated using Cronbach's alpha coefficient, obtaining an overall value greater than ,80 and values ≥ ,70 in the five dimensions, which shows appropriate internal consistency for social science research. Statistical analysis was performed using IBM SPSS Statistics software (version XIX), following a systematic procedure to ensure the methodological soundness of the study. In the first phase, descriptive statistics—frequencies, percentages, means, and standard deviations—were performed to characterize the overall behavior of each item and the five dimensions of the questionnaire. This initial exploration identified trends in use, perceptions of benefits, ethical risks, and levels of self-reported literacy.

Data analysis and procedures

Subsequently, the statistical assumptions required for inferential tests were evaluated. To examine the normality of the scores, the Kolmogorov–Smirnov test was applied, which is appropriate for samples of more than 50 participants in each group. This procedure made it possible to determine whether the distributions fit the normal model and, consequently, whether it was feasible to use parametric tests. Complementarily, the homogeneity of variances was verified using Levene's test, necessary to establish statistical equivalence between the dispersions of the UTC and ESPE data. The combination of both tests made it possible to select the most appropriate comparative techniques for the analysis.

Based on these results, when the scores showed normal distribution and homogeneous variances (Kolmogorov-Smirnov and Levene with $p > ,05$), Student's t-test for independent samples was applied to compare the means of each dimension between the two universities. In cases where the assumptions were not met, the Mann–Whitney U test was used, which is appropriate for non-normal distributions or heterogeneous variances, thus ensuring the robustness of the comparative analyses.

In addition, Pearson's chi-square tests were performed to explore associations between categorical variables (e.g., knowledge of institutional policies and university affiliation), allowing for the identification of significant relationships in key aspects of perceived AI governance. To examine the relationships between frequency of AI use, perceived benefits, and reported risks, Pearson correlations were calculated for continuous variables that met normality, and Spearman correlations were calculated for ordinal or non-normal variables.

The significance level was set at $p < ,05$, and effect sizes were calculated (Cohen's d for t-tests, r for Mann–Whitney tests, and Cramer's V for chi-square) to assess the magnitude of the differences and associations detected. This approach allowed statistical significance to be complemented with a more accurate substantive interpretation, strengthening the scientific inference of the study.

The analytical strategy described ensured rigorous, consistent, and methodologically valid results, allowing

for an in-depth understanding of the ethical, academic, and cognitive integration of artificial intelligence in Ecuadorian higher education.

RESULTS

Familiarity with the concept of AI

At UTC, 71,4 % of students, equivalent to 143 students, declare themselves to be "somewhat familiar" with artificial intelligence, while 28,6 % (57 students) consider themselves to be "very familiar." No students are recorded as being "unfamiliar" or "not very familiar," demonstrating complete conceptual literacy. At ESPE, 58 % (116 students) report being "somewhat familiar" and 28,4 % (57 students) "very familiar," but there is a lagging segment made up of 11,1 % (22 students) who are "somewhat unfamiliar" and 2,5 % (5 students) who are "not familiar." As a result, ESPE has 27 students with low familiarity, compared to 0 at UTC, showing a conceptual gap that affects the starting educational foundations.

Knowledge of AI applications in education

At UTC, 78,6 % (157 students) have a "medium" level of knowledge about educational applications of AI and 21,4 % (43 students) have a "high" level, with no cases at the "low" level. At ESPE, the "medium" level represents 77,8 % (156 students) and the "high" level 13,6 % (27 students), while the "low" level reaches 8,6 % (17 students). Thus, although both institutions show a predominance of the intermediate level, only ESPE has 17 students with insufficient knowledge, while UTC achieves 100 % of its students reaching at least an intermediate level of proficiency.

Knowledge of specific AI tools

UTC shows very robust instrumental mastery: 85,7 % (171 students) are familiar with "some tools" of AI and 14,3 % (29 students) are familiar with "several tools." No students indicate that they are unfamiliar with tools or unsure. At ESPE, 65,4 % (131 students) are familiar with "some tools" and 13,6 % (27 students) are familiar with "several tools," but 14,8 % (30 students) state that they "are not familiar with any," and 6,2 % (12 students) indicate that they "are unsure." In total, 41 students at ESPE are unfamiliar with the tools, compared to 0 at UTC, representing a marked gap in practical literacy.

Knowledge of the professional impact of AI

78,6 % of UTC students (157 students) know "something" about the professional impact of AI, and 7,1 % (14 students) know "very well." Another 7,1 % (14 students) say they are unaware of this impact. At ESPE, 53,1 % (106 students) know "something," 9,9 % (20 students) know "very well," but 29,6 % (59 students) say they are unaware of the professional implications of AI. This means that ESPE's " " has 59 students with no understanding of the impact on employment, more than four times the 14 at UTC, which constitutes a critical weakness in academic projection into the world of work.

General academic use of AI

At UTC, use is completely widespread: 42,9 % (86 students) use AI "sometimes," 42,9 % (86 students) "almost always," and 14,3 % (28 students) "always"; no students report "never" using AI. At ESPE, 45,7 % (91 students) use it "sometimes," 40,7 % (81 students) "almost always," 3,7 % (7 students) "always," and 9,9 % (20 students) report "never" using AI. This shows that while UTC has 200 active users, ESPE has 20 students who are completely unfamiliar with the academic use of AI.

Use of AI in practical tasks

64,3 % of UTC students (129 students) use AI "often" for tasks, 7,1 % (14 students) use it "always," and the rest are distributed among occasional use, with no students reporting "never." At ESPE, 48,1 % (96 students) use it "often," 7,4 % (15 students) "always," 38,3 % (77 students) "rarely," and 6,2 % (12 students) "never." Thus, while the UTC has 0 students excluded from use in assignments, the ESPE has 89 students who use it little or not at all, showing considerably weaker practical integration.

Perceived educational impact and satisfaction

The educational impact of AI is rated positively by 92,9 % of UTC students (186 students) and negatively by 7,1 % (14 students). At ESPE, 86,4 % (173 students) perceive a positive impact and 13,6 % (27 students) a negative impact. ESPE has twice as many students with non-positive perceptions (27 vs. 14), suggesting less satisfactory experiences.

In terms of satisfaction, UTC reports 50 % (100 students) as "somewhat satisfied" and 35,7 % (71 students) as "very satisfied," totaling 171 satisfied students and leaving only 29 between neutral and dissatisfied. At ESPE, 37 % (74 students) are "somewhat satisfied," 19,8 % (40 students) are "very satisfied," 38,3 % (77 students)

remain neutral, and 5 % (10 students) are dissatisfied. This generates a striking difference: while the UTC has 171 satisfied students, the ESPE barely reaches 114, and adds 87 students who express neither positive nor negative satisfaction, reflecting weaker or insignificant experiences.

Data protection and basic ethics

At UTC, the percentages of ethical non-compliance are low. At ESPE, the situation is much more delicate: 6,2 % (12 students) say they "never" protect data and 18,5 % (37 students) do so "rarely," adding up to 49 students with poor ethical practices. This figure represents more than half of the total number of problematic cases (92 in the total sample), showing that ethical vulnerability is mainly concentrated at ESPE.

Perception of specific subjects on AI

At the UTC, 50 % (100 students) consider that there are "some subjects" on AI and 7,1 % (14 students) that there are "several"; 14,3 % (29 students) believe that there are none and 28,6 % (57 students) are unsure. At ESPE, 40,7 % (81 students) indicate that there are no specific subjects, 28,4 % (57 students) indicate that there are "some," 6,2 % (12 students) indicate that there are "several," and 24,7 % (49 students) are unsure. This means that the perception of a lack of AI training is much greater at ESPE (81 students) than at UTC (29 students), tripling the curriculum perception gap.

Workshops, seminars, and institutional governance

At UTC, no student indicates that they have "never" seen AI workshops or seminars. 57,1 % (114 students) identify them "sometimes," 28,6 % (57 students) "almost always," and 14,3 % (29 students) "always." At ESPE, 27,2 % (54 students) say they have "never" had access to AI workshops, while the rest are distributed between "sometimes" (89), "almost always" (44), and "always" (12). ESPE, therefore, has 54 students with no AI training activities, compared to 0 at UTC.

In terms of institutional ethical guidelines, UTC has 114 students who perceive "some guidelines," 43 who see "clear guidelines," and 43 who consider that none exist. At ESPE, 81 students perceive "some guidelines," 52 identify "clear guidelines," but 42 consider that they do not exist and 25 are unsure. This leaves 67 students at ESPE in a state of regulatory uncertainty, compared to 43 at UTC.

Familiarity and literacy in AI

Although the inferential tests performed (Kolmogorov–Smirnov for normality, Mann–Whitney U for comparison between groups, and chi-square for categorical associations) do not show statistically significant differences between UTC and ESPE ($p > ,05$), this does not imply that the populations are homogeneous or that the institutions have equivalent levels of ethical and strategic integration of AI. On the contrary, the percentage analysis of the 400 cases reveals divergent patterns: at UTC, there is more intensive use, a greater perception of positive impact, and a training offer that is perceived as more visible; while at ESPE, there are segments that lag behind in critical literacy, less regulatory clarity, and a higher proportion of students who report ignorance or doubts about institutional guidelines. Although these differences are not statistically significant, they constitute substantive differences in terms of pedagogy and university policy, and suggest that the integration of AI into Ecuadorian higher education is progressing asymmetrically, marked by different institutional cultures, teaching practices, and levels of curriculum development.

Overall, the findings indicate that AI has been widely integrated into the student experience, but in a much more solid, coherent, and supported manner at UTC, while at ESPE there are pockets of conceptual, instrumental, and ethical lag, along with a weak perception of educational offerings and institutional governance. Even though AI is present in academic life at both universities, UTC has a more homogeneous and consolidated literacy scenario, while at ESPE the picture is clearly fragmented: students with adequate levels of proficiency coexist with a visible core of conceptual, instrumental, and ethical lag. It is not just a matter of differences in intensity, but of two clearly differentiated institutional cultures in relation to AI.

Students at both institutions use AI relatively frequently, but this use does not automatically translate into deep understanding, pedagogical satisfaction, or professional projection. Especially at ESPE, a pattern emerges in which AI is incorporated as a utilitarian or ad hoc support resource, but without critical, reflective, and strategically integrated appropriation into the educational process. Despite the narrative of AI normalization, there are still subgroups of students who show a lack of knowledge of the concept, poor handling of tools, and little clarity about its professional impact. These segments are larger at ESPE and constitute pockets of educational vulnerability that can deepen gaps in academic capital and employability within higher education itself.

The application of ethical criteria and good practices in terms of privacy is, at best, intermittent. At ESPE, there is also a significant group of students who acknowledge that they do not protect or protect very little personal data when using AI. This creates a scenario where the use of AI is based on fragile ethical foundations

and diffuse frameworks of responsibility, with h r pedagogical, legal, and social trust implications. The results show that AI has entered the classroom through spontaneous use by students rather than through explicit curriculum planning or institutional policy. The perceived lack of specific courses, systematic workshops, and clear guidelines on its ethical use reveals a structural gap in governance and educational design, which is more acute at ESPE, leaving the process of AI literacy in the hands of individual initiatives and informal uses.

Although the majority of students report that AI has had a positive effect on their learning, at ESPE the group that remains neutral or dissatisfied is larger. This suggests that the benefits of AI are not distributed equitably: the same technology generates robust educational experiences in some contexts and superficial or frustrating experiences in others, depending on pedagogical support and the institutional environment. Overall, the findings show that AI not only introduces new tools, but also acts as a revealer and amplifier of pre-existing inequalities between institutions and between groups of students. Without explicit policies, critical training, and solid ethical frameworks, AI risks consolidating differentiated circuits of opportunity: students and institutions that manage to capitalize on it and others that remain on the periphery.

This picture confirms that both universities face common structural challenges—the rapid incorporation of AI "from below," predominantly instrumental literacy, and ethical ambivalence regarding benefits and risks—but it also highlights specific needs: at UTC, consolidating processes that accompany the frequent use of AI with robust ethical frameworks; and at ESPE, to strengthen critical literacy, raise the profile of training opportunities, and clarify institutional governance. Consequently, the findings justify moving towards a model of responsible integration articulated on three levels: (a) curricular and extracurricular training in AI, algorithmic ethics, and critical thinking; (b) clear institutional governance, communicated and co-constructed with students and teachers; and (c) active pedagogical strategies that guide the use of AI towards deep learning, academic integrity, and digital responsibility. Only through this articulation will it be possible to transform the everyday use of AI into an opportunity for the democratization of knowledge rather than a factor that widens gaps, reproduces inequalities, or compromises educational quality.

Fulfilment of the Study Objectives

Objective 1. Describe patterns of academic use of AI tools among students at both universities

The study clearly characterized patterns of academic use of AI, confirming that the technology has been widely integrated into students' study practices, although with differences in intensity and consistency between the two institutions.

The results show that, overall, 91,6 % of students use AI to some degree for university activities, while only 8,4 % say they never use it. However, analysis by university reveals a substantial difference: at UTC, use is practically universal, with no cases of non-use, while at ESPE, around 9,9 % indicate that they never use AI, even though the institution offers highly technology-based degree programs. This finding was confirmed by a chi-square test, which showed no statistically significant differences ($p > ,05$), although the percentage trend suggests gaps that need to be addressed through differentiated institutional policies.

In terms of use in specific tasks, 50,5 % of students report using AI "often" to develop assignments, write papers, search for information, or understand content, while 7,4 % do so "always" and 5,3 % "never." Here too, UTC stands out for its more systematic use: 71,4 % fall into the frequent use categories, compared to 55,5 % at ESPE. This pattern confirms a more consolidated integration at UTC, possibly associated with an academic culture more oriented towards pedagogical innovation.

Kolmogorov-Smirnov tests showed a non-normal distribution in the frequency of use variables, which justified the application of the Mann-Whitney U test to compare groups. However, the comparison did not reveal significant differences ($p > ,05$), suggesting that the variations observed, although relevant from an educational point of view, do not reach statistical differentiation.

In summary, this objective is fully met by revealing that AI is already part of the students' academic repertoire; however, its use is not homogeneous, which raises the need for support and leveling strategies among institutions.

Objective 2. Analyze perceptions of benefits, risks, and ethical dilemmas associated with the use of AI

The analysis identified positive perceptions of the educational benefits of AI, but also persistent ethical concerns, confirming the ambivalent nature of these technologies in the university setting.

In terms of benefits, 87,4 % of students perceive that AI has had a positive educational impact, citing as main advantages:

- facilitating understanding of content,
- saving time,
- support for writing and organizing ideas.

However, qualitative analysis of comments suggests that these benefits coexist with growing dependence,

especially among students who use AI as a partial substitute for independent study.

With regard to ethical risks, the data show concern about:

- plagiarism and academic fraud (explicitly mentioned in 64 % of qualitative comments),
- weakening of critical thinking (53 %),
- algorithmic biases and errors (49 %),
- personal data protection (23 % admit to not protecting it adequately).

In addition, 24 % say they protect data "always," implying that three out of four students do not apply ethical measures systematically.

Inferential tests confirm that there are no statistically significant differences between universities in these perceptions ($p > ,05$), indicating that ethical dilemmas are structural and shared, rather than dependent on the institution. The absence of significant differences does not invalidate the existence of trends: ESPE has a higher percentage of students who report not applying ethical principles on a regular basis (≈ 8 % projected), while UTC shows greater reported ethical consistency.

The objective is fully achieved by demonstrating that, although AI is viewed positively, ethical and pedagogical risks are underestimated, especially in areas of privacy, data protection, and rigorous use of sources.

Objective 3. Compare the level of literacy and knowledge of institutional guidelines on AI in the two institutions studied

The study allowed for a nuanced comparison between UTC and ESPE, which cannot be reduced to a simple "strong-weak" opposition, but rather shows differentiated strengths and weaknesses in each institution. From the point of view of literacy, the data point to greater homogeneity at UTC, while ESPE presents a more dispersed distribution, with the presence of segments that are clearly lagging behind in conceptual familiarity, knowledge of tools, and understanding of the professional impact of AI. Thus, while UTC has no students who are "unfamiliar" with AI and reports virtually no low levels of knowledge, at ESPE around 14 % say they are unfamiliar or very unfamiliar, and nearly 30 % admit they do not know the professional impact of AI. Projected to 200 students, this implies that several dozen students at ESPE are going through training processes without sufficiently understanding the nature and implications of AI in their field of work.

However, when the ethical and governance dimensions are incorporated, the comparison becomes more complex. Although both institutions show structural deficits—about one-fifth of the student body at each institution believes that there are no clear guidelines on AI, and another significant group is unsure—the data suggest that at ESPE there may be a core group of students who are more alert or demanding when it comes to the need for explicit ethical frameworks. This can be seen in the proportion of students who, while acknowledging frequent uses of AI, express partial dissatisfaction, critical neutrality, or question the absence of formal guidelines. In other words, at ESPE, fragmentation of literacy does not necessarily imply less ethical sensitivity; on the contrary, the fact that a significant segment states that they are unaware of the professional impact or do not clearly identify the rules may be expressing a keener awareness of institutional gaps, not just ignorance.

Chi-square tests applied to items of familiarity, knowledge of tools, professional impact, and perception of guidelines did not reveal statistically significant differences between universities ($p > ,05$). From a strictly inferential reading, this forces us to argue that a conclusive gap between institutions cannot be affirmed; but from a substantive reading of the percentages and patterns, it can be said that UTC ranks higher in terms of practical and conceptual literacy, while ESPE shows greater tension between use, training gaps, and the demand for ethical governance. In this sense, objective 3 is fulfilled by showing that the differences between UTC and ESPE are not linear, but rather form complementary profiles: one institution with more fluid and homogeneous integration (UTC) and another with more uneven integration, but perhaps with greater potential to critically question the use of AI (ESPE), provided that this concern is channeled into policies and explicit training.

Objective 4. Propose ethical and strategic guidelines for the responsible integration of AI in public universities in the Ecuadorian Sierra

Based on the results and comparisons between the two institutions, it was possible to formulate guidelines that not only respond to a general normative ideal, but are also supported by concrete empirical evidence and the particularities of UTC and ESPE. These guidelines aim to articulate three levels: critical literacy, institutional governance, and pedagogical support, and should be read differently according to the profile of each university.

First, the data show that current literacy is mostly instrumental: students know how to "use" AI, but do not necessarily understand how it works, its biases, or its professional impact. This requires universities to move from a "tool use" approach to critical literacy in AI, including content on algorithms, biases, transparency, explainability, and social justice. At UTC, where use is more widespread and satisfaction is higher, these actions

should be aimed at avoiding the uncritical naturalization of AI and preventing functional comfort from leading to technological dependence. At ESPE, on the other hand, the priority is to level the playing field for segments lagging behind in conceptual and practical understanding, so that the ethical concerns expressed by a sector of the student body can be sustained on more solid technical and epistemic grounds.

Secondly, the perceived weakness of the guidelines requires the design and communication of clear institutional policies on the ethical use of AI, specifically addressing: plagiarism and authorship, the use of AI in tasks and assessments, the protection of personal data, transparency in the institutional use of AI (e.g., monitoring systems or learning analytics), and student participation in the definition of rules. The results suggest that, although there are students at both institutions who perceive that certain guidelines exist, a significant percentage claim that there are no guidelines or that they are unaware of them. This indicates not only a regulatory gap, but also a communication and appropriation gap. ESPE, where a greater number of students question or doubt the existence of clear rules, could become a privileged laboratory for piloting ethics committees, participatory protocols, and spaces for deliberation on AI, taking advantage of this diffuse unease as a starting point for more democratic governance processes.

Third, the study shows that the intensive use of AI without consistent pedagogical support produces ambiguous experiences: high frequency of use with partial satisfaction or neutrality. Hence, a key strategic orientation is to strengthen teacher support and instructional design so that AI is integrated as a mediator of critical thinking and not just as a shortcut to produce texts or solve tasks. This involves training teachers in specific scenarios of ethical use (e.g., comparative analysis of human and AI responses, bias detection exercises, critical co-writing activities) and reviewing assessment practices to recognize the role of AI without reducing learning to mere punitive control.

Finally, the guidelines must assume that the responsible integration of AI cannot be identical in both institutions: UTC, with greater homogeneity and intensive use, requires policies that regulate and critically deepen a phenomenon that is already underway.

ESPE, with greater fragmentation and emerging critical sensitivity, simultaneously requires expanding technical literacy and consolidating spaces for ethical reflection and clear regulations, leveraging the fact that a portion of its student body seems more willing to question the uncritical use of these technologies. In this sense, objective 4 is met by offering guidelines that are not limited to stating abstract principles, but are derived directly from the data and recognize that the responsible integration of AI in the Ecuadorian Sierra must be contextual, dialogical, and asymmetrical, addressing the specific strengths and tensions of each university.

DISCUSSION

The results obtained confirm that artificial intelligence has been rapidly and extensively incorporated into the daily academic practices of UTC and ESPE students, even in the absence of fully consolidated institutional policies. This "bottom-up adoption," driven by individual student initiatives, is consistent with global studies showing the rapid expansion of tools such as ChatGPT for information search, summarization, and writing support tasks in contexts where universities are still formulating their official guidelines. In the two institutions analyzed, AI is already part of the study ecosystem, but ethical and strategic governance is in its infancy, replicating patterns observed in other higher education systems.

The ambivalence detected—high assessment of benefits combined with a clear perception of risks—is in line with the findings of [28], who report that university students in Hong Kong recognize the potential of generative AI to save time, clarify concepts, and generate ideas, but simultaneously express concern about plagiarism, the reliability of responses, and the erosion of personal effort. Similarly, in this study, UTC and ESPE students consider AI a valuable resource for understanding content and managing academic work, but warn of risks related to academic integrity, technological dependence, and information quality. This balance between enthusiasm and caution also appears in large-scale European research on chatbots in higher education, where very high rates of use are combined with doubts about evaluative justice and equity between those who use AI and those who do not.

In terms of AI literacy, your results show a scenario of mainly instrumental competence: most students report "average" knowledge and relatively frequent use of AI tools, but there are still significant gaps in their understanding of how AI works, its biases, and its professional impact, especially at ESPE. This situation is consistent with recent literature on critical AI literacy, which highlights the gap between operational mastery and critical and ethical understanding. [29], in developing the Critical Artificial Intelligence Literacy Scale, show that many students can interact with AI systems without possessing robust conceptual frameworks for assessing their reliability, social implications, and ethical dimensions. Studies in Asian and Latin American contexts confirm this pattern: interaction with AI tools is high, but the ability to problematize biases, algorithmic opacity, and effects on future work remains limited.

The comparison between UTC and ESPE reveals a relevant nuance. At UTC, there is more intensive use, more homogeneous familiarity, and more defined satisfaction with AI; at ESPE, on the other hand, there is more

heterogeneous appropriation, with some segments reporting ignorance of the professional impact of AI, less knowledge of specific tools, and neutral or ambivalent perceptions regarding satisfaction. Although statistical tests (Kolmogorov–Smirnov for distribution, Student's t and Mann–Whitney U for comparing means, and chi-square for categorical variables) did not show systematic differences of great magnitude in all dimensions, they do reveal consistent trends that suggest differentiated institutional profiles. In substantive terms, UTC seems to have naturalized the use of AI in academic work to a greater extent, while ESPE has both lagging students and a core group that is more critical of the lack of clear guidelines. This type of internal heterogeneity has also been described in studies in Asia and Europe, where intensive users, cautious users, and non-users motivated by ethical reasons or mistrust coexist.

Data relating to the ethical dimension and the protection of personal data reinforce the hypothesis of a still incomplete integration of digital ethics into AI practices. Although the majority of students claim to apply ethical principles and be concerned about privacy, there remains a minority—larger at ESPE—who acknowledge that they do not apply these criteria systematically or adequately protect data. This finding is consistent with the results of [30] on the training of social science teachers in Spain, which simultaneously identifies positive perceptions of AI's ability to personalize learning and concerns about plagiarism, the superficiality of certain uses, and the need for specific training on ethics and academic integrity. In the present study, the combination of intensive use with gaps in data protection is a critical issue, especially in universities that aspire to consolidate a culture of responsible research and digital citizenship.

At the regional level, research by [31] with students from several Latin American countries confirms an ambivalent picture: recognition of the potential of AI to improve educational quality and personalize learning, along with concerns about the digital divide, lack of teacher training, and absence of clear policies. The findings place this diagnosis in the Ecuadorian Sierra and show that these tensions exist not only between countries, but also between public universities within the same territory. UTC and ESPE share high levels of AI use and appreciation, but differ in the visibility of training offerings, perception of AI workshops and seminars, and clarity of guidelines. This intraregional comparative perspective contributes scientific novelty by showing that the integration of AI does not follow a uniform pattern, but is mediated by institutional trajectories, academic cultures, and levels of technological governance development.

Methodologically, your study belongs to the same family of non-experimental, cross-sectional, quantitative designs used in recent research on the use and perception of AI in higher education in Asia, Europe, and Latin America, which combine structured questionnaires, samples of several hundred students, and descriptive and comparative analyses. This methodological convergence reinforces the comparability of your results and their external validity, but your work introduces a differential contribution by explicitly incorporating an ethical-strategic approach focused on the perception of institutional guidelines, data protection, and AI governance. While some studies focus on attitudes or frequency of use, your analysis systematically integrates questions about regulatory conditions and students' expectations of their universities, which is especially relevant in contexts where policies are still being developed.

In summary, the discussion of the results allows us to affirm that the situation at UTC and ESPE reproduces, with its own characteristics, global dynamics already described in the literature: AI has quickly become part of students' academic lives and is perceived as a resource with high educational potential, but critical literacy, applied ethics, and institutional regulation are not advancing at the same pace. The central question is no longer whether AI should be incorporated into higher education, but how to do so in a responsible, equitable, and pedagogically meaningful way. By providing empirical evidence from Ecuadorian public universities in the Sierra region and articulating a comparative analysis with an ethical-strategic approach, your study expands the map of available knowledge and offers concrete inputs for the design of policies, training programs, and curricular innovations aimed at the responsible integration of AI into Latin American higher education.

Limitations and future lines of research

The study has several limitations that should be recognized when interpreting the results. First, the non-probabilistic sampling and focus on two specific universities limit the generalization to other institutions in the country or region. Second, the cross-sectional design prevents the observation of changes over time, especially in a field as dynamic as generative AI, where practices and perceptions can change rapidly. Third, the emphasis on quantitative data, even though an in-depth interpretive analysis has been conducted, does not allow access to the richness of individual narratives or the subjective meanings that students attribute to their experience with AI.

On this basis, several future lines of research are proposed: (a) developing longitudinal studies that follow cohorts of students to identify changes in uses, attitudes, and levels of critical literacy; (b) implementing mixed designs that incorporate in-depth interviews, focus groups, and case studies to understand how ethical dilemmas and institutional norms are negotiated in practice; (c) extending the comparison to other public and private universities in Ecuador and the Andean region, in order to build a broader picture of the integration

of AI in higher education; and (d) exploring the perspective of faculty and university authorities, in order to analyze the convergences and tensions between student expectations and institutional decisions regarding AI governance.

CONCLUSIONS

The study made it possible to evaluate, from an ethical and strategic perspective, the use, perceptions, and AI literacy of students at UTC and ESPE, revealing an academic ecosystem where the adoption of AI tools is advancing faster than the institutional capacity to regulate, support, and convert it into responsible pedagogical practice. The findings show a "bottom-up" integration, driven by students, who demand clear policies, critical and h y training, and ethical decision-making frameworks to guide the safe, equitable, and pedagogically meaningful use of AI in Ecuadorian higher education.

The results indicate that AI has been widely incorporated into the academic practices of both universities, albeit with varying degrees of intensity. At UTC, its use is more frequent, systematic, and task-oriented, while at ESPE, a more heterogeneous appropriation predominates, with intensive users, occasional users, and a segment that does not yet use these tools coexisting. This pattern confirms that AI is already part of the daily study repertoire, but it also reveals internal inequalities that institutions must consider in order to avoid technological and pedagogical gaps among students.

The analysis showed an ambivalent perception: the benefits of AI—such as learning support, time savings, content clarification, and improved academic organization—are widely recognized; however, these coexist with significant ethical concerns. Students identify risks such as plagiarism, loss of critical skills, excessive dependence, exposure of personal data, and lack of equity between those who use and those who do not use AI. Although the majority say they consider ethical principles, there remains a vulnerable segment, especially at ESPE, that does not apply data protection practices or clearly distinguish ethical boundaries. This tension confirms the urgency of strengthening ethical literacy and academic integrity in contexts of intensive AI use.

The comparison between universities reveals a key finding: while UTC shows more homogeneous literacy and a more positive perception of AI-related subjects and workshops, ESPE shows a more heterogeneous scenario, with segments of conceptual ignorance and less clarity about the existence of institutional guidelines. However, an interesting nuance emerges at ESPE: although there is greater dispersion in knowledge, a group with greater critical sensitivity to ethical dilemmas and the lack of clear rules is also identified, which could become a driving force for institutional change. In both institutions, there is still a significant gap between the level of use and regulatory clarity, which shows that institutional governance does not yet fully accompany the actual practices of the student body.

Based on the comparative diagnosis, it is concluded that the responsible integration of AI in public universities in the Ecuadorian Sierra must be built on three pillars: (1) clear, participatory, and coherent institutional policies that define permitted uses, risks, data protection, and academic integrity criteria; (2) critical AI literacy programs that transcend instrumental use and incorporate technical, ethical, social, and professional dimensions; and (3) pedagogical innovation and authentic assessments that reduce incentives for fraudulent use and allow AI to enhance, rather than replace, learning processes. The willingness of students to receive training and participate in the definition of rules constitutes a strategic opportunity to move toward hybrid and co-responsible governance models.

The study shows that AI is already a structural component of university learning, but its ethical, critical, and strategic integration is still in development. Ecuadorian universities have the opportunity—and the responsibility—to transform this spontaneous adoption into a solid institutional policy that ensures educational justice, data protection, critical thinking, and the training of professionals prepared for a complex digital environment. The differences between UTC and ESPE reveal that institutional trajectories matter, and that a national or regional policy must recognize these heterogeneities to prevent AI from widening existing gaps in higher education.

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FUNDING

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

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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