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(RESEARCH)

Artificial Intelligence as a Formative Tool in Undergraduate Marketing: Integrative Review and Inductive Study

Fernando Ivan Jaimes Rada

DCN

Julia Enith Herrera Mendoza

Universidad Nacional Abierta y a Distancia

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Abstract:

Artificial intelligence (AI) is currently being associated with changes in university education and is linked to the transformation in student learning. This research addresses this transformation through a qualitative study with marketing students from the Andean Area University Foundation (Areandina) and the National Open and Distance University (UNAD) in Colombia, who use virtual education models. Through pedagogical analysis, the evolution of AI use in asynchronous activities was examined. Using a reflective thematic analysis of forums and deliverables, free participation was contrasted with guided AI use. The analysis was complemented by an integrative review comprising a narrative contextual synthesis and a systematic component. The findings reveal that technological appropriation is crucial: as students correctly used the tool, they progressed from seeking superficial answers to relying on AI to contextualize and verify information with critical thinking, observed alongside greater accuracy and academic quality. The study suggests that, instead of banning AI, institutions should promote its ethical and critical use, prioritizing assessments that value the use of strategies and decision-making over the automated final outcome.

Keywords: Artificial intelligence; Higher education; Marketing; Critical thinking; Authentic assessment.

1. Introduction

Generative AI is being linked to changes in both marketing practice and its academic teaching. This article analyzes how AI can be positioned as a formative and instrumental tool (used to verify sources, brainstorm options, construct counterarguments, and defend decisions), rather than being used as an executive shortcut for automated content generation. In marketing, AI is applied to personalization, behavioral prediction, and advanced segmentation for analysis and strategy creation, which in turn intensifies debates about privacy, bias, authorship, and outcome evaluation.

Currently, access to ICT resources and tools is globalized and increasingly democratized, not only in educational settings but in all aspects of people daily life. In the specific case of AI (regardless of type, whether free or paid, its origin, or focus), access is primarily limited by the availability of data and connectivity through smartphones, laptops, or desktop computers. With the evolution of social networks, blogs, and email marketing platforms, companies like Meta and Google offered direct marketing environments for customer segmentation, campaign management, and real-time analytics. The evolution of the digital environment demands new professional skills (SEO, content marketing, web analytics) and the ability to create relevant and valuable content, a fundamental condition for capturing the attention of clients and consumers. Organizations have also begun allocating specific budgets to paid social media advertising, CRM,

automation, and so on. This creates a new demand for marketing professionals with specific skills for these new environments and the ability to strategically use all these digital tools, platforms, and technologies to promote brands, products, or services, to reach an audience through media or online channels such as social networks (TikTok, X, Instagram), websites, search engines, email, and digital advertising to increase brand visibility, foster meaningful interactions, and strengthen customer loyalty.

In this context, university professors face the challenge of adapting traditional teaching methods to incorporate technological tools, both in pedagogy and in measurement and evaluation. Therefore, universities need to be at the forefront of studying and analyzing all technological advancements to develop or adjust their policies and strategies, aiming to guide both students and professors effectively in teaching and learning the minimum competencies and skills required in these new environments. From the perspective of "minimum conditions", adequate technical resources, an active digital presence and professional skills (SEO, content, analytics, CRM) enable the ethical adoption of AI in university marketing education: AI appears to add value when used for established data and channels, complements ideation and measurement, and does not replace human judgment in decision-making and strategy formulation.

Given that many AI tools are user-friendly and intuitive, universities, beyond simply providing and training students in the technical/professional use of AI in marketing tasks, should focus more on teaching its responsible and ethical use. At Areandina, the Business Marketing program is delivered through a virtual methodology that prioritizes practical and innovative learning over traditional lectures. This approach leverages the "Virtual Route" platform, an interactive digital environment that integrates multimedia resources, simulators, and teamwork to create immersive experiences. Students participate in active learning methods such as mirror classrooms, do case studies, formative research, and virtual fieldwork, complemented by internal agency and business lab projects for real-world application. This methodology emphasizes autonomous and reflective learning, preparation for the global market, and the development of digital marketing and artificial intelligence skills. For its part, UNAD also offers its Marketing programs through a virtual learning methodology, emphasizing the practical application of knowledge in marketing and digital business through simulated scenarios, technological tools, and real-world case studies. The curriculum integrates digital marketing, e-commerce, social media strategies, SEO/SEM, and data analysis, fostering strategic, analytical, and creative thinking. These flexible e-learning models leverage virtual campuses for asynchronous activities (forums, case studies, assessments) and online tutoring, promoting problem-based learning, teamwork, and leadership, and preparing professionals for innovation and competitiveness in the digital age.

Due to its distance and asynchronous teaching methodology and the intensive use of virtual platforms and IT tools, the study is aligned with the programs of both Areandina and UNAD, providing an opportunity for the development of analytical skills by allowing traceability of student deliverables and documented feedback. This article synthesizes evidence of institutional practices and knowledge at both universities, proposing principles for the responsible integration of AI, in accordance with an ethical framework and authentic assessment. It suggests that undergraduate marketing education should focus on enabling students to learn to make decisions and design strategies with the help of AI, rather than delegating these decisions and strategy generation to it.

2. Methodology

This is an inductive exploratory qualitative study, virtual classroom-based, complemented by an integrative review comprising a contextual narrative review and a systematic component aligned with PRISMA. The study was based on specific observations of changes and evolution in the quality of student work, oral defenses, and class contributions in Marketing courses at Areandina and UNAD. The need for AI literacy and limited knowledge of its capabilities, limitations, and biases were identified. Descriptive indicators of performance evolution were collected (originality, quality of argumentation, coherence, and process traceability). Some common patterns were identified: a predominance of "executive" use (shortcuts such as automatic writing/summarizing) versus "instrumental" use (source verification, ideation, counterargumentation, and oral defense).

Student performance was assessed using a coding scheme and an analytical rubric that operationalized three constructs: originality, quality of argumentation, and traceability. Specific indicators were defined for each dimension: for originality, independent synthesis, contextual adaptation, and critical interpretation of the similarity index; for argumentation, logical coherence, use of evidence, counterargumentation, and oral/written defense; and for traceability, the description of each phase in the learning guides and the instructions given in the CIPAS (Communities of Interaction and Social Participation by its Spanish acronym), the synchronous meetings, and IA parameters. The rubric established four performance levels (Excellent, Good, Acceptable, Deficient) with observable criteria for each indicator, applied to artifacts such as forum posts, drafts, and final submissions. The procedure included scoring per unit and calculating averages per phase (Phase 2 vs. Phase 3), supplemented by reflective memos and an audit log to

ensure transparency and credibility; no inferential statistics were performed. Themes are developed by the researcher; reflective memos and an audit log document the analytical decisions.

2.1. Context and participants

At Areandina and UNAD, ICT have been implemented to improve the originality of online assessments, case study analysis, project-based activities, and process traceability, using tools such as *Turnitin*. The courses selected for this research were taught at Areandina and UNAD. Both institutions utilize a virtual learning modality supported by ICT resources and tools. Activities included forums, student-presented case studies, and assessments, with an emphasis on originality protocols and digital ethics. Participation developed organically within the framework of regular coursework.

The learning structure is phased within each academic period. Each phase includes asynchronous support through collaborative forums that serve as learning spaces to monitor progress and improve assignments. The qualitative analysis encompassed forum contributions (posts/responses), intermediate drafts, and final submissions at each phase. It was documented the evolution of rigor, accuracy, contextualization, and traceability in the writing, including explicit references to CIPAS elements and verification practices.

2.1.1. Collaborative forums (structure and timing)

The forums consist of groups of five students who post and refine their progress toward the deliverable within a defined timeframe, typically 15 business days to one month. The forum dynamic promotes shared standards, peer feedback, and iterative improvement according to explicit guidelines.

2.1.2. Intervention: Training in Google AI Studio + Use of Gemini

Between Phase 2 and Phase 3, students received training in Google AI Studio for trend mapping. They compared the results from Gemini 3.0 Pro with a basic Gemini configuration (quick and generic responses), learning to consider AI as a foundation that needs to be contextualized, supplemented, and verified.

2.1.3. Guidelines given in the CIPAS (Communities of Interaction and Social Participation by its Spanish acronym)

The instruction emphasized the following elements: prompt, context, task, rationale (for constructing prompts), limitations, and required document type. Students learned to remove bracketed markers and insert precise, exercise-specific details (e.g., product/service variables and constraints).

2.2. Sampling

A purposive sampling of classes and artifacts (strategy reports, drafts, analytical narratives, oral defenses) was conducted, prioritizing cases with documented histories of indications and oral defense components. Student information by university is shown in Tables 1 and 2.

Table 1: Distribution of Areandina Students

Course.	Number of Students
Fundamentals of Management	71
Endo marketing	40
Marketing Audit	4
Service management	39
Strategic management	42
Total Students	196

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Table 2: Distribution of UNAD Students

Class or subject.	Number of Students
Mega Trends in Marketing	74
Consumer Psychology	66
Total Students	140

Of the 336 students from both universities, 290 met the requirements to participate in the forums and also submit written work in both phases of the study (2 and 3), so they correspond to the sample size.

Table 3: Sample Areandina and UNAD Universities

Variable	Description / Value
Program academic	Marketing
Mode	Virtual and distance
Areandina students	196
UNAD Students	140
Total number of students	336
Areandina student age range	18 to 40
UNAD student age range	21 to 47
Total age range of students	18 to 47
Average age of Areandina students	25
Average age of UNAD students	31
Average age of all students	28 (rounded to nearest year)
Gender (M/F/O)	Not available
Academic level	Baccalaureate Academic
Sample size	290
Sampling specification	Students who participated in the forums and submitted written work during Phases 2 and 3.
Number of groups	68
Size by group	≈4–5 students

2.3. Sources and data collection

Data sources included forums and student evaluations from virtual platforms, along with reflective statements on AI use and oral defense notes. Information review and categorization were based on a predefined set of categories and aligned with the stated objective. Non-participant observations (field notes); rubric-guided review of artifacts; reflective statements on AI use; and oral defense notes were also used. No inferential statistics were performed; the patterns are descriptive and generate hypotheses.

2.4. Level constructs and anchors

- Originality: degree of independent synthesis and novelty; minimum textual AI text; adaptation to the context.

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- Quality of argumentation: logical coherence, use of evidence, counter-argumentation and ability to defend decisions orally/in writing.
- Traceability: documentation of indications, iterations, sources; transparent workflow that links AI interactions with final results.

The validation rubric was integrated for the dimensions of Originality, Argumentation and Traceability, aligned with the design described in the manuscript: collaborative forums by phases, formative intervention with Google AI Studio/Gemini, CIPAS guidelines (indication, context, task, foundation, limitations and type of document) and emphasis on authentic assessment.

Figure 1. Evaluation flow by phases and sources of evidence

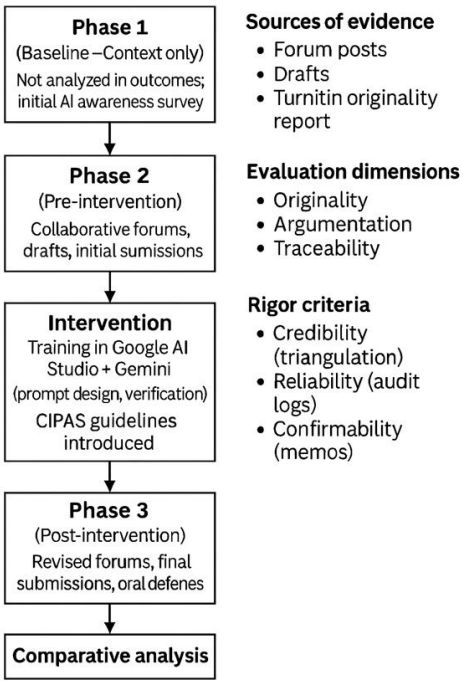

Table 4: Analytical evaluation rubric - Evaluation criteria for Originality with four levels (4-Excellent, 3-Good, 2-Acceptable, 1-Poor).

Level	Descriptor	Observable criteria
4	Excellent	Independent synthesis with its own voice; contextual adaptation; eliminates placeholders; critically interprets similarity index; instrumental use of AI.
3	Good	Reformulate appropriately; contextualize; briefly interpret similarity index; partial evidence from CIPAS.
2	Acceptable	Predominant paraphrasing; minimal adaptation; moderate-high similarity without analysis; mostly executive use of AI.
1	Deficient	Unreviewed AI output dependency; incomplete placeholders; unjustified high similarity; no CIPAS.

Table 5: Analytical evaluation rubric - Evaluation criteria for Argumentation with four levels (4-Excellent, 3-Good, 2-Acceptable, 1-Poor).

Level	Descriptor	Observable criteria

4	Excellent	Clear logical structure; sufficient and relevant evidence; counterargues; solidly defends decisions.
3	Good	Overall consistency with some gaps; adequate evidence; acknowledges objections; correct defense.
2	Acceptable	Uneven sequence; scant or generic evidence; superficial counterargument; weak defense.
1	Deficient	Claims without support; inconsistencies; no counterargument; does not defend decisions.

Table 6: Analytical evaluation rubric - Evaluation criteria for Traceability with four levels (4-Excellent, 3-Good, 2-Acceptable, 1-Poor).

Level	Descriptor	Observable criteria
4	Excellent	Learning guide activity; dated versions; links/DOI; AI usage statement; clear process-product link.
3	Good	Partial learning guide activity; basic versioning; some linked sources; visible process-product relationship.
2	Acceptable	Loose evidence; undated changes; incomplete references.
1	Deficient	No record of prompts /iterations; no versions; missing sources; process opacity.

The RTA coding emphasized transparency through memos and audit logs rather than inter-rater reliability metrics; the rubric's face/content validity was supported by peer reports among instructors.

2.5. Rigor criteria

- Credibility: Triangulation of observations, artifacts, and oral defenses; peer reports, forums, drafts, final exams and peer briefings; reliability through an audit log (quick guidelines, iteration logs).
- Reliability: audit records (protocols, coding memos, rubric).
- Reflexivity: positioning statements and memos to explain assumptions.
- Confirmability: through reflective memos and anonymous examples. All activities were part of the regular coursework and complied with institutional ethics.

2.6. Ethical considerations

Approval and consent were obtained in accordance with institutional policies. No personally identifiable information was collected; the artifacts were products of coursework used for pedagogical purposes. Participants were informed that disclosure of AI use and documentation of the process were part of the evaluation. Data were securely stored and reported in aggregate form; examples were anonymized.

2.7. Data adequacy and arrest criteria

Sampling continued until further observations and artifacts revealed a decline in novelty (information power). The interruption was due to the end of classes and the academic term at both universities.

2.8. Limits of evidence and non-inferential stance

The findings are observational/descriptive. No causal claims are made. The claims are presented as patterns associated with instrumental use, not as proven effects. They are based on virtual learning contexts and rely on online artifacts (forums, case studies, assessments), which may not be generalizable to face-to-face settings.

2.9. Integrative review

The review was structured into two distinct components: a narrative synthesis and a systematic review. The former aimed to contextualize the use of artificial intelligence in higher education and marketing, incorporating institutional documents, ethical guidelines, and pedagogical examples from both universities considered relevant to understanding the conceptual and regulatory framework. The latter was developed following the PRISMA 2020 framework , with explicit inclusion and exclusion criteria, a systematic search of accredited sources using keywords and time limits

(2021–2025), and the refinement of an initial sample of 38 documents to a final sample of 13 articles. Although no meta-analysis was performed, the systematic review provided rigor in the selection and organization of the evidence, while the narrative allowed for the integration of findings and practices within a broader pedagogical context, ensuring that both approaches remained separate yet complementary within the methodological design.

2.9.1. Narrative review and synthesis

The following documents (previously known and familiar) from the repositories of both universities were incorporated, containing ethical guidelines for AI, originality, and online evaluation protocols:

Table 7. Repositories of both universities with ethical guidelines for AI, originality and online evaluation protocols.

University	Qualification	Document type	Year	DOI or URL
Areandina	National Resolution No. 4 of 2024: pentalogue of responsible and ethical use of AI	Resolution	2024	https://cms.arandina.edu.co/sites/default/files/2024-02/Resolucion-Nacional-4-de-2024-Pentalogo.pdf
Areandina	Recommendations for citing documents and academic output generated with the support of artificial intelligence models	Working document	2024	doi:10.57786/n7ns-w217
UNAD	Responsible use of Artificial Intelligence for your academic and scientific projects	Library event	2025	https://eventos.unad.edu.co/repositorio-de-eventos/biblioteca-2025/uso-responsable-de-la-inteligencia-artificial-para-tus-proyectos-academicos-y-cientificos

2.9.2. Systematic review

The literature inclusion criteria focused on articles from high-quality sources in accredited publications, such as academic journals, by:

- Literature search: To identify, refine, and select publications with DOIs (2021–2025) on (i) AI applied to marketing/strategies—including customer experience —, (ii) AI in higher education, and (iii) methodological works/editorial ethics related to generative AI/ ChatGPT.
- Sources and scope: The primary source was Crossref (public API) and indexed publishers' websites (Springer, SAGE, Wiley, Taylor & Francis, MDPI, Emerald, Frontiers), prioritizing records with DOIs. Synthesis articles and methodological frameworks (e.g., PRISMA 2020) were also consulted.
- Search strategy: Complementary thematic queries were applied (AI + higher education; AI + marketing/ advertising / customer experience; generative AI/ ChatGPT + ethics/editorial policies), restricted to 2021–2025 and present DOI.
  Inclusion criteria (I) : I1: Direct relevance with marketing/strategies (incl. CX) and/or higher education; I2: Methodological documents/standards and editorial ethics on generative AI; I3: Valid DOI and date 2021–2025.
- Exclusion criteria (E): E1: No DOI or outside the range; E2: areas without a clear thematic link; E3: duplicates.
- Screening and selection process (1) Aggregation of results by thematic block; (2) duplication by DOI; (3) screening by title/ venue / abstract; (4) application of I/E; (5) verification of metadata (year/ venue).
- Results: 38 publications with DOI were obtained (2021–2025): methodological frameworks (NIST AI RMF; PRISMA 2020), reviews and frameworks in marketing and customer experience , and literature on generative AI in higher education and ethics/editorial.

- Limitations: Coverage depends on metadata from Crossref /publishers; availability and language biases may exist. No meta-analysis was performed; the synthesis is descriptive.
- Reproducibility: Searches can be replicated with Crossref (`from-pub-date:2021-01-01, until-pub-date:2025-12-31, has- https://doi.org/true `) and subject strings; it is recommended to document extraction date and export JSON/CSV.

Table 8. Publications excluded from the 38 publications with DOI (2021–2025):

#	DOI	Qualification	Year	Source/Magazine	Axis
1	10.1186/s41239-023-00392-8	Artificial intelligence in higher education: the state of the field	2023	International Journal of Educational Technology in Higher Education	Higher education / Systematic review
2	10.1177/02734753241288876	A Constructivist Approach to Integrating AI in Marketing Education	2025	Journal of Marketing Education	Marketing education
3	10.1177/14413582241252904	Integrating Artificial Intelligence and Customer Experience	2025	Australasian Marketing Journal	Customer Experience / Marketing
4	10.1002/mar.21619	AI in marketing, consumer research and psychology: a systematic review	2021	Marketing Intelligence & Planning (Wiley)	Marketing / Systematic Review
5	10.1177/09711023241272308	Artificial Intelligence in Marketing: Two Decades Review	2024	NMIMS Management Review (SAGE)	Marketing / Review
6	10.1007/s11747-024-01064-3	How generative AI Is shaping the future of marketing	2025	Journal of the Academy of Marketing Science	Marketing / Generative AI
7	10.1177/07439156241286499	Generative AI in Marketing: Promises, Perils, and Public Policy Implications	2025	Journal of Public Policy & Marketing (SAGE)	Marketing / Public policy / Ethics
8	10.3389/fcomm.2025.1523077	Ethical requirements for generative AI in brand content creation	2025	Frontiers in Communication	Marketing / Ethics / Branded Content
9	10.1007/s11023-024-09694-w	Mapping the Ethics of Generative AI: A Comprehensive Scoping Review	2024	Minds and Machines (Springer)	Generative AI / Ethics
10	10.6087/kcse.352	Ethical guidelines for the use of generative AI in scholarly publishing	2025	Science Editing	Generative AI / Editorial Ethics
11	10.1108/IJOES-04-2024-0112	Ethical dimensions of generative AI: a cross-domain analysis	2025	International Journal of Ethics and Systems (Emerald)	Generative AI / Ethics

12	10.30935/ cedtech /15775	Ensuring academic integrity in the age of ChatGPT	2025	Contemporary Educational Technology	Higher education / Academic integrity
13	10.1007/s10805-024-09543-6	ChatGPT Unveiled: Understanding Perceptions of Academic Integrity in Higher Education	2024	Journal of Academic Ethics (Springer)	Higher education / Ethics / Integrity
14	10.1016/j.caeai.2024.100326	Generative AI in Higher Education: Seeing ChatGPT Through Universities' Policies	2024	Computers & Education : Artificial Intelligence	Higher education / Policies
15	10.48550/arXiv.2402.01659	Generative AI in Higher Education: Evidence from Institutional Policies	2024	arXiv / DataCite DOI	Higher education / Policies
16	10.1080/23311975.2024.2348728	Artificial intelligence in marketing: exploring current and future trends	2024	Cogent Business & Management (Taylor & Francis)	Marketing / Systematic Review
17	10.22598/ mt /2024.36.2.153	Transforming Customer Experience through AI: The Marketers' Perspective	2024	Tržište	Customer Experience / Marketing
18	10.1108/JRIM-09-2024-0452	Exploring customer stickiness during smart experiences: AI chatbots	2025	Journal of Research in Interactive Marketing (Emerald)	Customer Experience / Chatbots
19	10.3390/jtaer20010031	Measuring Customer Experience in AI Contexts: A Scale Development	2025	Journal of Theoretical and Applied Electronic Commerce Research (MDPI)	Customer Experience / Measurement
20	10.1177/02734753241269838	The Future of Marketing and Marketing Education	2025	Journal of Marketing Education (SAGE)	Marketing education / Foresight
21	10.1177/0273475325133695	Artificial Intelligence and the Future of Marketing Education	2025	Journal of Marketing Education (SAGE)	Marketing education
22	10.1007/s11747-020-00749-9	A strategic framework for artificial intelligence in marketing	2021	Journal of the Academy of Marketing Science	Strategic marketing framework
23	10.1080/00913367.2025.2460985	Understanding Customer Responses to AI-Driven Personalized Journeys	2025	Journal of Advertising (Taylor & Francis)	Customer Experience / Personalization

24	10.1007/s44163-024-00105-8	Between artificial intelligence and customer experience: a literature review	2024	Discover Artificial Intelligence (Springer)	Customer Experience / Review
25	10.1108/REGE-02-2025-0026	Generative AI: capturing strategic value in businesses	2025	Management Magazine (Emerald)	Business/Marketing / Generative AI

Depuration

To refine the expanded sample (n=38) to a subset of publications with DOIs (2021–2025) that contribute: (i) relevant frameworks/standards and methodological guidelines (NIST AI RMF; PRISMA 2020), (ii) evidence on AI in higher education (reviews, evaluation, innovation), (iii) AI applications to marketing/ advertising and personalization (incl. customer (iv) ethics/use of generative AI (ChatGPT) in academic/publishing contexts.

Inclusion criteria (I): I1: Key normative/methodological documents (e.g., NIST AI RMF; PRISMA 2020). I2: Studies on AI in higher education (systematic reviews; evaluation; innovation). I3: AI applied to marketing/ advertising and personalization strategies (social media; CX). I4: Ethics and use of generative AI/ ChatGPT in academic publishing (recognition, best practices, impact). I5: Valid DOI and publication between 2021–2025.

Exclusion criteria (E): E1: Industrial/business fields without a direct link to marketing, higher education, or editorial ethics. E2: Generic reviews without applicable methodological contributions or without a focus on HE/marketing/editorial ethics. E3: Duplicates or thematic redundancies with respect to more comprehensive studies . E4: No DOI or outside the time frame.

Procedure: I/E were applied to the previously screened set of 38 articles, verifying title/ venue /abstract and metadata (DOI, year). Priority was given to the diversity of themes (methodology, HE, marketing, ethics/ GenAI) and practical relevance. The result is the final sample (n=13).

Limitations: The selection depends on editorial metadata and may be subject to availability/language bias. The synthesis is descriptive (without meta-analysis).

Figure 2. PRISMA 2020 flow diagram of literature screening (2021–2025)

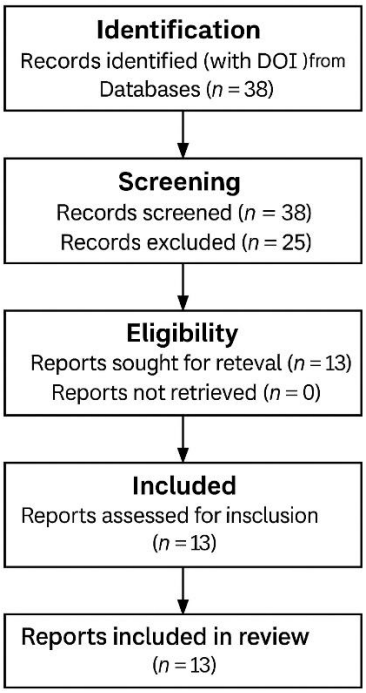

Table 9. Selected publications from the 38 publications with DOI (2021–2025) (n=13):

#	DOI	Qualification	Authors	Year	Source/Magazine	Axis
1	10.6028/NIST.AI.100-1	Artificial Intelligence Risk Management Framework (AI RMF 1.0)	E. Tabassi	2023	NIST	Methodological/standard
2	10.6028/NIST.AI.600-1	AI RMF: Generative Artificial Intelligence Profile	C. Autio et al.	2024	NIST	Methodological/standard
3	10.3390/info15110676	Generative AI and Higher Education: Trends, Challenges, and Future Directions	J. Batista; A. Mesquita ; G. Carnaz	2024	Information (MDPI)	Higher education / Generative AI
4	10.3389/feduc.2024.1391485	AI in higher education: a systematic literature review	IM Castillo-Martínez et al.	2024	Frontiers in Education	Higher education / Systematic review
5	10.3390/bs15050700	The Role of AI in Personalizing Social Media Marketing Strategies for Enhanced Customer Experience	H. Beyari ; T. Hashem	2025	Behavioral Sciences (MDPI)	Marketing / Social media / Personalization
6	10.2501/JAR-2021-002	Artificial Intelligence in Advertising: How Marketers Can Leverage AI	K. Kietzmann; J. Paschen; T. Treen	2021	Journal of Advertising Research	Marketing / Advertising
7	10.1136/ bmj.n 71	The PRISMA	MJ Page et al.	2021	BMJ	Methodological/PRISMA

		2020 statement				
8	10.1007/s11192-024-05193-y	How is ChatGPT recognized in academic publications?	M. Kousha	2024	Scientometrics	Generative AI / Editorial Ethics
9	10.3390/nanomanufacturing3020009	Good practices for scientific article writing with ChatGPT and other AI language models	A. Castellanos-Gómez	2023	Nanomanufacturing (MDPI)	Generative AI / Editorial Ethics
10	10.1093/ scipol /scae079	Perspectives on the use of ChatGPT in academic publications	A. Kardes ; E. Oran	2024	Science and Public Policy	Generative AI / Editorial Ethics
11	10.3389/frma.2024.1486832	Global insights: ChatGPT's influence on academic publishing and research practices	M. Malik et al.	2024	Frontiers in Research Metrics and Analytics	Generative AI / Editorial Ethics
12	10.1080/22054952.2024.2372154	ChatGPT, Copilot, Gemini and other AI tools versus higher education assessments	M. Nikolic et al.	2024	Australasian Journal of Engineering Education	Higher education / Assessment
13	10.24310/ijtei.111.2025.20896	Artificial intelligence and educational innovation: trends and challenges	—	2025	Innoeduca (IJTEI)	Higher education / Innovation

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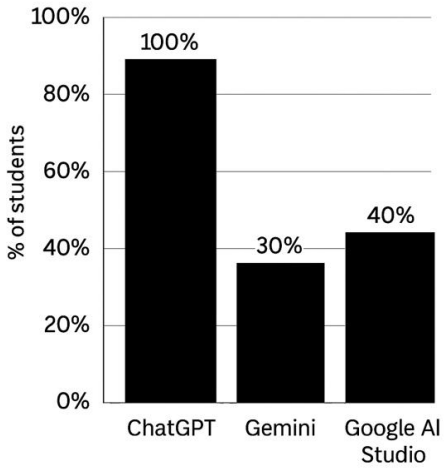
3. Results

Context from Phase 1 (baseline; not analyzed in outcomes), of the 290 students who met the requirements to participate in the forums and also submit written work in both phases of the study (2 and 3), 100% of the sample stated that they knew or had heard of the ChatGPT AI , 30% stated that they knew or having heard of Gemini AI and 40% stated that they knew or had heard of Google AI Studio .

Figure 3. Students' initial awareness of AI



3.1. Rigor and precision in forum interventions

Following the Google AI Studio training, forum contributions became more rigorous and precise: students removed placeholders, added exercise-specific variables (products, services, contextual constraints), and explicitly referenced guidelines elements when presenting progress.

For quality analysis, the document was analyzed using Turnitin software to check for non-original content. Percentages per university are calculated based on the courses distribution (Table 1: 196 Areandina ; 140 UNAD) and are presented in Table 10.

Table 10. Quality Results — Phase 2 (Low quality in forum interventions out of 290 students active in forums and submissions)

University	Low quality (n)	% of total (290)	% within university
Areandina	121	41.72%	61.73%
UNAD	90	31.03%	64.29%
Total	211	72.76%	-

The results of phase 3 are presented in Table 11.

Table 11. Quality Results — Phase 3 (Low quality in forum interventions)

University	Low quality (n)	% of total (290)	% within university
Areandina	60	20.69%	30.61%
UNAD	44	15.17%	31.43%
Total	104	35.86%	-

The raw output generated by AI is detectable upon careful inspection, particularly when more than a few paragraphs are involved and the topic relates to scientific work. Regarding textual inaccuracies and biases, the authors are ultimately responsible for the text generated by AI systems.

A very wide range of possible responses was evident, which caused the AI to generate invented information to "fill the gaps," observed alongside hallucinations caused by the use of confusing, ambiguous, or incomplete prompts.

Regarding originality, the high non-original content is identified in phase 2 (Table 12).

Table 12. Originality Results — Phase 2 (High Non-Original Content)

University	High non-original content (n)	% of total (290)	% within university
Areandina	94	32.41%	47.96%
UNAD	81	27.93%	57.86%
Total	175	60.34%	-

Although non-originality rates remain non-trivial in Phase 3, artifacts show clearer traceable synthesis (attribution, contextualization, and defense), which aligns with process-based originality rather than verbatim novelty.

Table 13. Originality Results — Phase 3 (High Non-Original Content)

University	High non-original content (n)	% of total (290)	% within university
Areandina	48	16.55%	24.49%
UNAD	30	10.35%	21.43%
Total	78	26.90%	-

3.2. Rapid literacy and model usage (Gemini 3.0 Pro vs. Basic)

The students learned to evaluate the differences between the model configurations. Instead of accepting quick, generic responses from the basic configurations, they iterated through the prompts and parameters to obtain more comprehensive results from Gemini 3.0 Pro, contextualized them, and verified them.

3.3. Critical review and contextual enrichment

The discussions in the collaborative forums demonstrated more critical thinking and robust verification practices. Students compared AI information with course sources and their prior knowledge, observed alongside more compelling and well-founded writing.

Phase 2 → Narrative results of phase 3

Compared to Phase 2 (literacy with limited guidance), Phase 3 showed considerable improvements in scores and greater accuracy in final submissions. Responses were better aligned with the questions defined for each stage, and the traceability of decisions improved.

The quality and originality analysis was repeated using *Turnitin* software. The comparative results between phase 2 and phase 3 are shown in Table 14.

Table 14. Comparison of Phase 2 vs Phase 3 — Quality and Originality

Metrics	University	Phase 2 (n)	Phase 2 (% uni)	Phase 3 (n)	Phase 3 (% uni)	Absolute variation (n)	Relative change (%)	Delta pp
Quality (low)	Areandina	121	61.73%	60	30.61%	-61	-50.41%	-31.12
Quality (low)	UNAD	90	64.29%	44	31.43%	-46	-51.11%	-32.86
Quality (low)	Total	211	72.76% (of total)	104	35.86% (of total)	-107	-50.71%	-36.90
Originality (high not original)	Areandina	94	47.96%	48	24.49%	-46	-48.94%	-23.47
Originality (high not original)	UNAD	81	57.86%	30	21.43%	-51	-62.96%	-36.43
Originality (high not original)	Total	175	60.34% (of total)	78	26.90% (of total)	-97	-55.43%	-33.45

When comparing Phase 2 (without knowledge of prompts) with Phase 3 (with knowledge), a considerable increase in grades and accuracy of submissions is observed.

The students stated that, while learning to use the Gemini 3.0 Pro vs. Basic AI, they focused on improving the quality of the prompts they gave the AI, reducing its tendency to hallucination. They better defined the context: specifying the topic, format, and scope, thus reducing uncertainty. In short, they understood that the more precise and structured the prompt, the less the model needs to "to fabricate data" content, because it has clear instructions and less ambiguity. This doesn't completely eliminate hallucination, but it significantly reduces it by narrowing the generation space.

Forum dynamics and peer learning: Groups of five students and periods of 15 to 30 days fostered peer feedback and iterative refinement. Students collaboratively identified accuracy gaps and applied CIPAS elements, accelerating convergence toward high-quality results.

Based on the 336 students and 290 active participants in both phases, a substantial reduction in low-quality interventions was observed between Phase 2 and Phase 3, following the training intervention (Google AI Studio, working with Gemini and guidelines given in the CIPAS).

Both universities showed marked improvements, with UNAD decreasing low-quality interventions by −32.86 percentage points and Areandina by −31.12 percentage points between Phase 2 and Phase 3.

Regarding originality (high non-original content), Areandina reduced it from 47.96% (94/196) to 24.49% (48/196), and UNAD reduced it from 57.86% (81/140) to 21.43% (30/140). These figures reflect a substantial improvement in originality and quality, attributable to context-oriented AI literacy and verification, which reduces inaccuracies and improves the relevance and accuracy of the texts.

4. Discussion

The findings support the need for AI as an assistive tool, rather than a substitute for critical thinking and decision-makers. In marketing, this means using AI to analyze data, visualize scenarios, and validate hypotheses, while ensuring that the final outcome or strategy is a well-reasoned and defended product built by people. Achieving this requires clear institutional guidelines (e.g., policies on traceability and originality; an AI "pentalogue" and faculty training), ethical and technical expertise, and authentic evaluation that values the process (ideation, iterations, and decisions) over the results.

4.1. Use of Instrumental vs. Executive AI

Instrumental use (verification, ideation, counter-argumentation, defense) is associated with greater engagement and ownership; executive shortcuts carry the risk of superficiality and dependency. Patterns are observed in process records and oral defenses. AI may present challenges for university professors in identifying the level of originality and creativity in an initial analysis. This and other questions have begun to arise, such as: When using AI in document creation, does it become an author, a collaborator, or simply a tool?

4.2. Favorable conditions

Alignment with policies (ethical guidelines), explicit statements on the use of AI, process-oriented rubrics, and oral defenses foster accountability and originality. Faculty training and clear communication are essential. It must be officially and institutionally determined whether the respective AI chatbot should be cited and described in the bibliography and/or described as a collaborative tool.

The following table shows the findings obtained in the systematic review articles regarding the background of the respective AI chatbot being cited and/or described as a collaborative tool:

Table 15. Background of the respective AI chatbot being cited and/or described as a collaborative tool:

Article	DOI	Example of mention
Kousha (2024), Scientometrics	10.1007/s11192-024-05193-y	*We used ChatGPT to refine the language of this manuscript.*
Castellanos-Gómez (2023), Nanomanufacturing	10.3390/nanomanufacturing3020009	*The authors acknowledge the use of ChatGPT for improving the clarity of the manuscript.*
Kardes & Oran (2024), Science and Public Policy	10.1093/ scipol /scae079	*Authors should disclose the use of ChatGPT for text generation to ensure transparency.*
Malik et al. (2024), Frontiers in Research Metrics and Analytics	10.3389/frma.2024.1486832	*We acknowledge ChatGPT for assistance in language editing.*
Nikolic et al. (2024), Australasian Journal of Engineering Education	10.1080/22054952.2024.2372154	*Performance of ChatGPT, Copilot, and Gemini was compared in solving engineering tasks.*

4.3. AI literacy and professional skills

High usage coexists with digital literacy gaps; the integration of digital ethics and marketing skills (SEO, content, analytics, CRM) positions AI as a tool for learning other tools and advocating for data-driven strategies and transparent sourcing. “Digital ethics”, an ethics of AI use, should be a mandatory university subject integrated into curricula.

It was observed that, as students began to differentiate or understand that the quality of the result generated by AI depended on or improved according to the quality of the information they provided, they focused more on the (input) information than on the final result (output), which led to an overall improvement in the quality, not of the decisions and strategies taken, but of their defense with their own criteria and deep marketing fundamentals.

Key observations include:

i. Educational benefits (personalized learning, automated feedback, administrative efficiency) when AI is integrated.
ii. Improved student performance when AI is geared towards ideation and analysis (instrumental use) rather than automatic generation of responses (executive use)

iii. High use of AI by students for problem solving and content creation, coexisting with specific training gaps, which requires ethical and technical knowledge.
iv. The formative role of AI in the analysis, segmentation and validation of hypotheses, maintaining the final strategy as a human creation with bias audits and transparent sourcing.
v. Integrity and assessment practices that reinforce originality in online environments, complemented by authentic designs (local cases, oral defenses, process-oriented rubrics, and AI use statements).
vi. A "pentalogue" for the responsible and ethical use of AI, specialized teacher training and institutional communications, along with opportunities to join international networks (e.g., UNITWIN/UNESCO Chairs).

5. Conclusion and Future Work

AI appears to bring educational and professional value when integrated as a tool for learning and strategy design, not as a substitute for creativity and analysis. Universities can strengthen this adoption through guidelines for the ethical teaching of applied AI (not only in this case to marketing), responsible use protocols, and authentic, process-centered assessment. Future work includes designing rubrics that emphasize traceability and oral advocacy; implementing guidelines for AI applied to marketing (bias, privacy, source verification); evaluating the impact of instrumental AI use on creativity and performance through studies; exploring participation in international networks or partnerships (UNITWIN/UNESCO Chairs and AI in Education research alliances) through pilot projects and agreements; and institutionalizing binding guidelines with ethical audits and algorithmic impact assessments prior to implementation and adoption of participatory AI.

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