



Generative AI in higher education: adoption, purposes of use, and perceived competencies among digital natives

IA generativa en educación superior: adopción, fines de uso y competencias percibidas en nativos digitales

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Abstract

Generative AI has become consolidated in higher education, yet its contribution to skills development remains under debate. This study examines the use and perception of generative AI among digital natives enrolled in techno-creative degrees at a Spanish university. Using an anonymous survey (N = 138), we analysed adoption profiles, purposes of use, complementary resources, and the perceived contribution to the development of curricular competencies. The results indicate widespread but selective adoption: instrumental and ideation uses (support for academic tasks and inspiration) predominate, along with triangulation practices with external sources and

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predominantly self-directed learning. However, students do not generally attribute improvements in higher-order skills (creativity, critical thinking, entrepreneurship) to generative AI, viewing it more as transversal digital literacy than as a competitive differentiator. We conclude that a shift from instrumental to strategic use is needed, supported by pedagogical scaffolding, traceable assessment, and evidence-based alignment between curriculum and employability.

Keywords: generative AI, higher education, digital natives, technology adoption, digital literacy generative

Resumen

La IA generativa se ha consolidado en la educación superior, pero su aportación competencial sigue en debate. Este estudio explora el uso y la percepción de la IA generativa entre nativos digitales universitarios de titulaciones tecnocreativas en una universidad española. Mediante una encuesta anónima (N=138), analizamos perfiles de adopción, fines de uso, recursos complementarios y contribución percibida al desarrollo de competencias del plan de estudios. Los resultados evidencian una adopción amplia pero selectiva: predominan usos instrumentales y de ideación (apoyo a tareas académicas, inspiración) junto con prácticas de triangulación con fuentes externas y aprendizaje mayoritariamente autodidacta. En cambio, no se atribuyen mejoras generalizadas en competencias de orden superior (creatividad, pensamiento crítico, emprendimiento), percibiéndose la IA más como alfabetización digital transversal que como ventaja competitiva. Concluimos que es necesario transitar del uso instrumental al estratégico mediante andamiaje pedagógico, evaluación con trazabilidad y una alineación currículo-empleabilidad basada en evidencias.

Palabras clave: IA generativa, educación superior, nativos digitales, adopción tecnológica, alfabetización digital

1. INTRODUCTION

Artificial intelligence (AI) has become a transformative force in education, particularly in higher education, where it has evolved from simple search engines into solutions capable of generating content and analysing complex information. This development has opened up opportunities to enhance access to knowledge, support skills development, and prepare individuals for digital transformation (Ghobakhloo et al., 2021). This evolution forms part of the Fourth Industrial Revolution (Kagermann et al., 2011; Schwab et al., 2016), characterised by the convergence of AI, the Internet of Things (IoT), robotics, and big data to optimise processes within a knowledge-based economy.

In the professional sphere, especially in highly skilled occupations, digital and technological skills are now a prerequisite. Employability reports highlight a shortage of profiles with a strong digital foundation to meet demand in emerging occupations such as AI, data analytics, UX, machine learning, digital communication, and technological entrepreneurship (Observatorio de las Ocupaciones, 2022; ONTSI, 2021). In this context, AI is increasingly recognised as a strategic capability for addressing Industry 4.0 and accelerating processes, thereby sustaining business competitiveness (Ashoka Deutschland and McKinsey, 2018; Biloslavo et al., 2024; Keding, 2021).

The impact of AI is particularly visible in sectors where creativity and communication are central. Adoption is increasing across music, film, and entertainment, where AI supports storytelling and music production (Anantrasirichai and Bull, 2022). Large corporations (Forbes, BBC, The Washington Post, Microsoft) and platforms (Spotify, Netflix) use AI to enhance productivity and optimise recommendations. In fashion and marketing, H&M, Mango, and Inditex apply AI to campaigns and customer experience, while in influencer marketing, avatars such as Fit_Atina—the first AI model created in Spain—are emerging. Overall, AI is increasingly being integrated as a collaborative tool across the creative cycle, from ideation to production and interactivity.

According to Zhang et al. (2021), companies are increasing their technological investment to accelerate the adoption of machine learning, while facing two key challenges: attracting qualified talent and mitigating risks. As a result, technological readiness is now a prerequisite for employment, with e-skills increasingly valued in management, communication, and collaborative projects (Álvarez-Maldonado et al., 2024). In this context, people and AI can form a high-value synergy (Tsao et al., 2024), which reinforces the need to educate digital natives to review and update the professional skills demanded by the market.

The integration of AI into higher education adds value by enabling individualised learning and improving efficiency (George and Wooden, 2023). This requires rethinking methodologies to incorporate them as a key resource in the development of professional skills (Ashoka Deutschland and McKinsey, 2018). Students' perceptions are largely positive (Strzelecki, 2023; Shahzad et al., 2024), which justifies further study.

evidence remains limited on patterns of generative AI use among digital native university students—particularly in techno-creative degree programmes—as well as on their preferences and the ways in which they combine different tools with complementary resources throughout their workflows. This gap raises several questions: What are digital native university students who use generative AI like? For what purposes do they use it? Do they rely solely on generative AI, or do they also use other resources to extend or verify their creations and learning? To what extent do they perceive generative AI as contributing to the acquisition of the specific skills outlined in their university curriculum?

This analysis is particularly relevant in university programmes focused on technocreativity, where AI offers opportunities, while also raising dilemmas about the nature of creativity. Although creativity and innovation have traditionally been considered exclusively human traits (Morozova and Schulte, 2021; Redin et al., 2023), their application in fields such as audiovisual production, design, animation, and marketing increasingly depends on technological support (Pu et al., 2024; Toumi et al., 2021). In this context, the present study aims to explore and characterise the use of generative AI among digital native university students, with particular attention to techno-creative degree programmes.

2. THEORETICAL FRAMEWORK

The launch of ChatGPT for public use in 2022 marked a milestone in higher education, prompting rapid student adoption and the emergence of new forms of automation in the classroom (Bouteraa et al., 2024; Strzelecki, 2024; Vo and Nguyen, 2024). Since then, debate has centred on its educational potential and its ethical and pedagogical implications (Lim et al., 2023), fuelling interest in understanding how, when, why, and for what purposes it is used (Firat, 2023). Perceptions are mixed: scepticism persists regarding the quality of outputs and potential effects on critical thinking and creativity (Amoozadeh et al., 2024; Baek et al., 2024; Creely, 2024), in contrast to views that highlight its value as a complementary resource that can enhance writing and analytical reasoning (Arbab et al., 2024; Kayali et al., 2023; Petricini et al., 2023).

One of the central debates concerns the relationship between AI and human creativity. The evidence is ambivalent: some entrepreneurship students perceive that chatbots stimulate creativity and ideation (Dwivedi et al., 2023; Vecchiarini and Somià, 2023), while others question the authenticity of this purported “artificial creativity” (Runco, 2024). Moreover, AI still appears to depend on human judgement to initiate and conclude the creative process (Vinchon et al., 2023). Even so, where its potential is recognised, its incorporation into the curriculum is often supported due to its capacity to support problem-solving and drive innovation (Marrone et al., 2022).

The rise of generative models (deep learning, NLP and image) is transforming creative and business sectors by accelerating production and reducing costs. Understanding the evolution of the human-machine interface is essential for anticipating its impact on media, journalism, audiovisual arts, design, advertising, and marketing (Pavlik, 2023). Recent examples include the AI-generated cover of *Cosmopolitan* (Liu, 2022), the Toys “R” Us short film at Cannes Lions (Spangenberg, 2024), hybrid campaigns by Coca-Cola and Cruzcampo (Reuters Fact Check, 2023), projects such as *Maharaja in Denims*, a Bollywood production by Us showcased at Cannes Lions (Spangenberg, 2024), the short film *Next Stop Paris* produced by TCLtv+ Studios, 2025 (Bustos, 2024), as well as video games such as *Oasis* (El Espectador, 2024).

AI-related e-skills are increasingly emerging as a differentiating factor for young professionals, particularly in contexts where project management, digital communication, and technological entrepreneurship are critical for labour market entry. At the same time, the literature highlights AI as an unprecedented opportunity for value creation and entrepreneurship (Iansiti and Lakhani, 2020; Giuggioli and Pellegrini, 2023): its accessibility and low cost can enable digital projects and enhance competitiveness (Baldegger et al., 2020; Chalmers et al., 2021; Wamba-Taguimdje et al., 2020), while its integration into entrepreneurship programmes can stimulate curiosity, applied research, and idea generation (Vecchiarini and Somià, 2023).

However, a notable ambivalence remains: students recognise the professional relevance of AI, yet fear its impact on job opportunities (Almaraz et al., 2023). This uncertainty reflects predictions of a profound reconfiguration of skills, occupational profiles, and business models (Baek et al., 2024; Budhwar et al., 2023).

3. METHODOLOGY

In this study, we conducted a survey of students at a Spanish university enrolled in degree programmes in Audiovisual Communication, Product Creation and Development, Video Games, and Animation. These programmes were selected due to their creative, communicative, and technical orientation, as well as the extensive use of technological solutions in these fields for content creation, design, marketing strategies, and the development of independent projects (Jiménez-Marín et al., 2012; Taborda-Hernández, 2022). The university also promotes entrepreneurship and professional networking, in line with the broader trend towards professionalisation in higher education (García et al., 2020). The study was designed in 2023–2024, and fieldwork was conducted between September and November 2024 (first semester 2024–2025). We used convenience sampling to recruit participants whose future employment is likely to be affected by the emergence of generative AI in creative domains. Data were collected via an anonymous online survey, using a Likert-type questionnaire to assess the adoption of generative AI, purposes of use, complementary resources, and perceived contributions to the development of skills included in the curricula of their degree programmes. In a face-to-face setting, clear and consistent instructions were provided to all participants across the different programmes; however, they were able to complete the survey at a time they considered most appropriate, to ensure anonymity and voluntary participation. A sufficiently long fieldwork window was set to allow participants adequate time to complete the questionnaire.

Participants were duly informed about the purpose of the research; therefore, it was deemed unnecessary to obtain authorisation from the university's Research Ethics Committee. Furthermore, the study did not entail any obligations regarding data custody or ARCO rights under the Organic Law on Data Protection. The questionnaire

was designed to collect information on participants' profiles (e.g., gender, age, degree programme, and whether they had used AI in the previous year, among other aspects) and to assess students' perceptions of the usefulness of different AI tools for academic and professional purposes. Prior to launch, the questionnaire was pre-tested with a small sample that included professors, researchers from various universities, and professionals with experience in technological and educational innovation. They reported a good understanding of all items after assessing their relevance, clarity, and internal consistency. Nevertheless, some pilot participants provided minor suggestions regarding AI tools considered relevant in communication and audiovisual production studies, as well as among students more broadly.

A total of 150 responses were obtained, representing 17% of the population. After excluding incomplete responses, the final sample comprised 138 participants (15.7% of the population), providing adequate representation for statistical analysis. The sample was predominantly female, and the most represented age group was 20–22 years. By degree programme, the largest group was enrolled in the Bachelor's Degree in Audiovisual Communication (AVC), followed by Industrial Design and Product Development Engineering (IDPDE), and Digital Creation, Animation and Video Games (DCAV) (see Table 1).

TABLE 1. Results of the descriptive analysis of the sample: gender and qualifications
(source: own elaboration)

Gender	Nº	%	Degree	Nº	%
Male	50	36,2%	Industrial Design and Product Development Engineering (IDPDE)	47	34,1%
Female	83	60,1%	Digital Creation, Animation and Video Games (DCAV)	23	16,7%
Not identified with any	5	3,6%	Audiovisual Communication (AVC)	68	49,3%
Total	138	100	Total	138	100

4. RESULTS and DISCUSSION

The analysis of the survey data yields a series of findings on the use of generative AI, including the specific technological tools employed, university students' reasons for use, and the complementary resources used alongside generative AI (see Table 2):

Table 2. Use of generative AI among university students in techno-creative degree programmes (source: own elaboration)

Use and type of Generative AI solution		
Use of Generative AI solutions	Number	(%)
None	8	5,8%
At least 1	21	15,2%
2 - 4	80	58%
> 5	29	21%
Total	138	100%
The most widely used Generative AI by type	Number	(%)
Text and writing	112	81,2%
Image	84	60,9%
Chatbot	43	31,2%
Design	42	30,4%
Creativity and arts	42	30,4%
Voice	22	15,9%
Life assistant	22	15,9%
3D	11	8,0%
Code and IT	7	5,1%
The reasons why I use these AI tools are:		
Reasons for using AI tools	Number	%
To find examples that will help complete academic assignments	86	62,3%
To find inspiration for a personal/professional creation	67	48,6%
To understand some content taught in a specific subject that I had not fully grasped	59	42,8%
Curiosity, entertainment and fun/humour	42	30,4%
In addition to using AI tools, to complete and validate the information obtained, I consult some of the following sources of information:		
Information sources used in addition to AI tools	Number	%
Professional journals	111	80,4%
Articles in professional or business blogs	88	63,8%
Training material from professionals disseminated on social media such as YouTube or Instagram	75	54,3%
Academic and scientific search engines such as Google Scholar, Scopus, etc.	73	52,9%
Books and manuals	68	49,3%
Specialised journals	31	22,5%
Scientific journals	26	18,8%
I do not carry out any additional searches	9	6,5%

Regarding the use of generative AI among university students in techno-creative degree programmes, the data shows that 94% of students regularly use at least one generative AI tool. Text- and writing-based functionalities, such as ChatGPT, are the most widespread, likely because they are the most widely recognised and the easiest to use –and to obtain useful outputs– in an academic context, as predicted by Bouteraa et al. (2024), Strzelecki (2023) and Vo and Nguyen (2024).

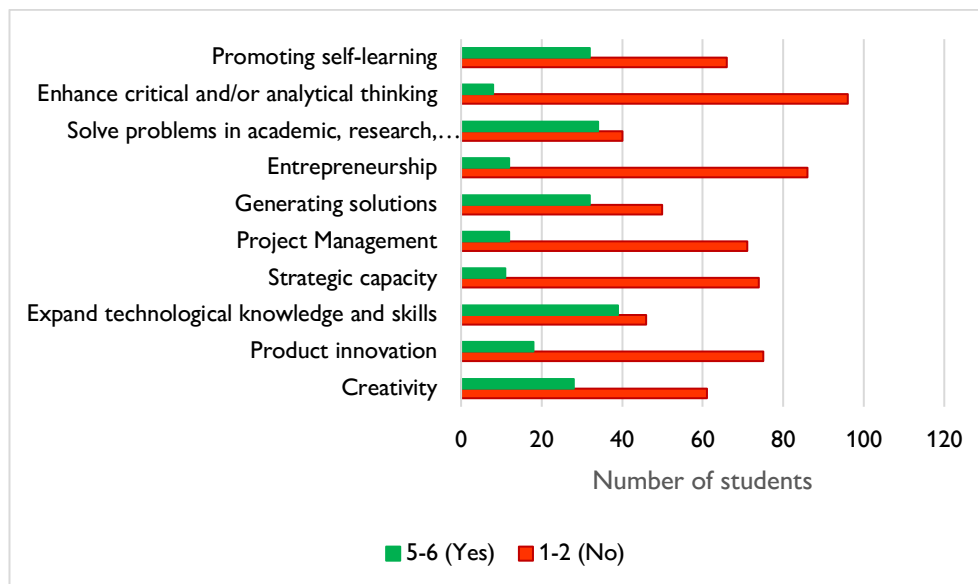
This suggests substantial uptake of these tools across creative, communication, and technical domains. It is also consistent with perceived usefulness and ease of use as key drivers of technological integration within academic and/or professional settings. Only 21% report intensive use of more than five tools. Most students use several tools – typically between two and four– indicating both the high penetration of these emerging technologies in their activities and a tendency to explore different AI applications. In addition to ChatGPT, students use –albeit to a lesser extent– other tools such as DeepL, Bing, Canva, Vizcom, DALL·E, and other image generators. This pattern may reflect broad exploration of functionalities ranging from writing support to visual design and multimedia production.

The results reveal extensive use of external resources to supplement the information generated by generative AI: 80.4% of students consult professional journals and 63.8% use specialised blogs. This pattern suggests that students combine sources with greater editorial authority with more agile, practice-oriented channels, rather than relying exclusively on AI. Overall, the observed behaviour is consistent with practices of verification and self-regulated learning, which are particularly relevant in techno-creative degree programmes, where integrating sector-specific knowledge and technical skills often requires complementarity between rigour and applicability. In addition, nearly 62% of participants report learning to use these new technologies through self-directed learning, either by exploring features intuitively or by consulting acquaintances, specialised forums, or video tutorials.

Although students recognise the value of generative AI, they do not perceive it as a tool for developing soft or strategic skills, indicating a gap between the technology's theoretical potential and its perceived practical contribution. A clear dichotomy emerges: a subset values it for expanding technological knowledge (28%), problem solving (25%), self-learning (23%), and generating solutions (23%). By contrast, higher-order skills associated with these degrees receive markedly less recognition: creativity (20%), entrepreneurship (9%), and critical thinking (6%) (see Figure 1). In terms of the specific uses of generative AI, its use is largely oriented towards education, either to complete tasks or to address learning gaps. Students report using generative AI primarily for academic purposes –completing academic tasks (62%) and understanding course content (43%)– as well as to generate ideas for their work. This

may reflect the nature of creative degree programmes, which often require a substantial level of inspiration and access to references.

Figure 1. Use of AI to improve specific techno-creative skills (responses 1–2 “against” and 5–6 “in favour” on the Likert scale) (source: own elaboration)



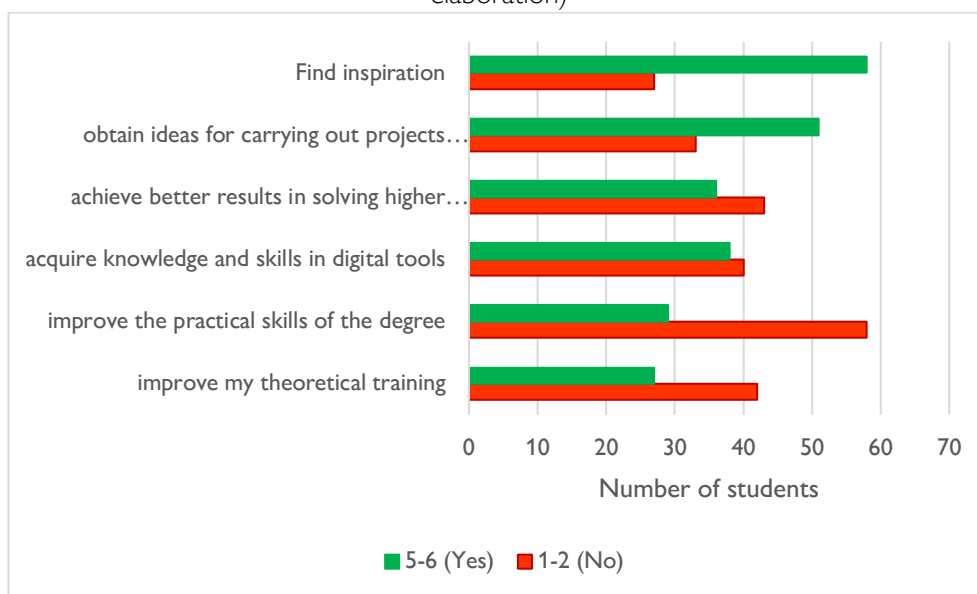
However, it should be noted that, although these students are enrolled in techno-creative degree programmes, only one in five believes that generative AI enhances their creativity. This contrasts with arguments that generative AI already plays a leading role in creative industries (film, design, video games, advertising) as a collaborative agent in ideation and production processes (Pu et al., 2024; Toumi et al., 2021). It is possible that students perceive generative AI as a useful auxiliary tool, but not as a resource that enhances creativity or fosters innovation.

The results indicate a limited and heterogeneous adoption of generative AI. Although some students consider it useful for expanding technological skills (28%) and supporting problem solving (25%), there is substantial rejection of its role in self-learning (48% ‘no’) and in generating solutions (36% ‘no’). Students also adopt a markedly critical stance regarding higher-order skills: 62% do not perceive improvements in entrepreneurial skills and 70% do not perceive improvements in critical–analytical thinking. Furthermore, simple majorities do not associate generative AI with product innovation, strategic capacity, or project management. The presence of a sizeable segment of intermediate responses suggests disparate experiences and a lack of pedagogical scaffolding. Overall, the pattern points to a largely instrumental acceptance, linked to specific tasks, and notable scepticism regarding complex skills, reinforcing the need for instructional designs that make explicit the contribution of generative AI to verification, argumentation, and decision-making processes.

This scenario contrasts with the expectation –typical of the Industry 4.0 context– that AI will function as a strategic competence and a lever for developing techno-creative and entrepreneurial skills (TCE), which are relevant both in the classroom and in the labour market. From an institutional perspective, this would support the view that AI can enhance employability and entrepreneurship in creative sectors and digital domains. However, students' perceptions qualify this perspective: only a small group (approximately 9%) report that these technologies improve entrepreneurial activities or project management. This partially contradicts the propositions advanced by Iansiti and Lakhani (2020), Wamba-Taguimdje et al. (2020), Baldegger et al. (2020), Chalmers et al. (2021), and Giuggioli and Pellegrini (2023) regarding digital entrepreneurship, strategic planning, and the generation of new business ideas.

Furthermore, the results of this study show that university students use generative AI for a range of purposes, notably to seek inspiration (42%) and generate ideas for launching a project (37%). However, an equally substantial proportion (42%) believe that generative AI contributes little to improving the practical skills associated with their degree programmes, suggesting a use pattern more oriented towards ideation than towards the development of applied skills (see Figure 2).

Figure 2. Perception of the usefulness of AI tools for improving academic skills (responses 1-2 'against' and 5-6 'in favour' on the Likert scale) (source: own elaboration)

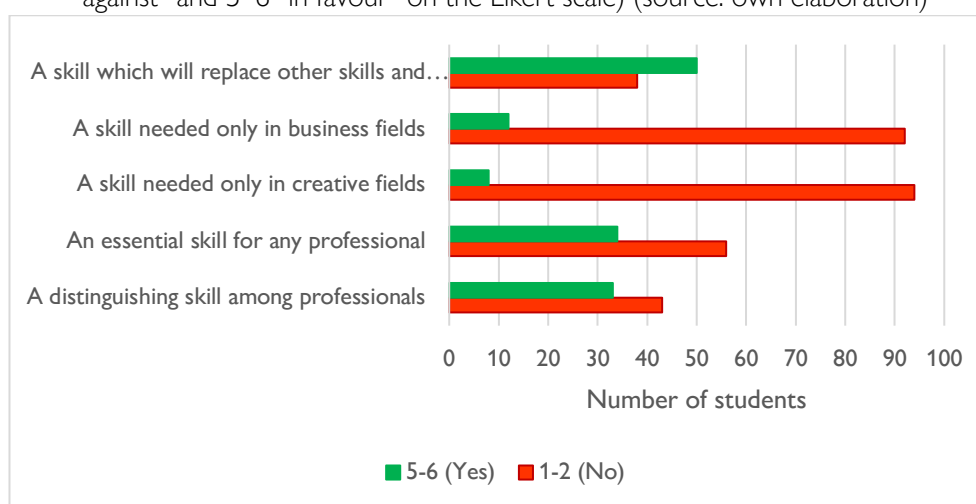


Regarding perceptions of professional and entrepreneurial skills, students' assessments appear somewhat fragmented. Although generative AI is valued as a necessary skill in a future in which it may displace other skills (36%), it is neither perceived as essential nor regarded as a threat. Moreover, the prevailing view is that it will not be a differentiating factor among professionals (31% versus 24% who believe it will). Similarly, 41% maintain

that professional use of AI will not be essential for any profile (versus 25% who believe it will be), and a clear majority –more than 65%– believe that it is not exclusive to any specific field. Overall, the picture that emerges is of a useful and widely adopted skill, but one that is not yet perceived as a hallmark or a *sine qua non* requirement (see Figure 3).

The fact that most students opt for free tools may reflect limited affordability and/or a preference for experimenting with free alternatives to paid options. This diversity in AI use suggests that students may be indirectly developing TCE skills, which are essential for working in industries such as design, animation, digital marketing, and audiovisual production. In this respect, Generative Adversarial Networks (GANs) illustrate a direct application in the visual content-creation and design tools used by students.

Figure 3. Perception of the impact of AI on professional skills (responses 1–2 “against” and 5–6 “in favour” on the Likert scale) (source: own elaboration)



As content consumers, students are becoming aware that generative AI is already a reality in their professional fields, where it is beginning to play a leading role in the effective management of organisations and their communication, in digital content creation (advertising, social media, avatars), and in the production of a range of leisure and cultural outputs (films, music, art, among others). However, they appear to take a short-term view of this technology, associating it mainly with specific tasks.

In terms of perceptions regarding use, usefulness, and outcomes, generative AI is viewed as a tool that supports autonomous learning and creativity, aligning with the current literature. Yan et al. (2024) show that self-directed learning is strengthened because users perceive personalised support. Chandrasekera et al. (2025), in turn, argue that generative AI enhances creativity by improving design outcomes and reducing users' cognitive load. Similarly, Sáez-Velasco et al. (2024), in the context of arts education, attribute this effect to the substantial support AI provides in generating illustrative material, without replacing human creativity. Finally, Zhou and Lee (2024) estimate

increases of 25% in creative productivity and 50% in the value of artistic work, reinforcing the idea that these tools not only facilitate autonomous learning but also enhance the efficiency and quality of creative processes.

However, tensions persist regarding whether generative AI is suitable for complex tasks, whether it may constrain critical thinking or genuine creativity, and the accuracy and reliability of the information produced by these tools. In this regard, the evidence from our data appears to indicate a degree of mistrust, or at least a critical awareness of the limitations of generative AI and the need to verify sources. The literature reflects similar reservations: on the one hand, students are reluctant to use it for complex tasks such as writing complete essays, viewing this as unfair and akin to plagiarism, while they tend to support its use for bounded tasks such as grammatical revision (Johnston et al., 2024); on the other hand, concerns about output quality reinforce scepticism about applying it to more complex tasks (Deschenes and McMahon, 2024).

This underscores the need for educational institutions to implement targeted training programmes that equip students with the skills to appraise, discern, and verify information obtained through these technologies, while also instilling values related to copyright protection, not only in academic practice, but also with a view to students' future business and creative careers.

5. CONCLUSIONS

Generative AI is already part of the everyday repertoire of techno-creative students, particularly for devising and completing specific tasks. This exploratory study examines the use and perceptions of generative AI among digital natives enrolled in techno-creative degree programmes at a Spanish university. The results indicate widespread but selective adoption: AI is primarily integrated as instrumental support for specific academic tasks (searching for examples, writing, editing, understanding content) and as a lever for ideation (inspiration and idea generation). In parallel, a consistent pattern of triangulation with external sources (professional journals, specialised blogs, academic search engines, and training materials on social networks) is observed, indicating habits of verification and self-regulated learning. Use of free versions and self-directed learning in tool use predominates.

Regarding the research questions, the study (i) profiles users characterised by broad but heterogeneous adoption and a largely instrumental orientation; (ii) identifies uses centred on ideation and academic support; (iii) confirms the systematic use of external sources to expand and verify information; and (iv) shows that perceived contributions are concentrated in digital literacy and performance support, rather than in higher-order curriculum skills.

By contrast, students do not generally translate this use into improvements in higher-order skills such as creativity, entrepreneurship, critical thinking, product innovation,

strategic ability, or project management. Overall, there appears to be a gap between the theoretical potential of generative AI and its perceived practical value for developing technocreative and entrepreneurial soft skills. For this group, AI is viewed more as a cross-cutting element of digital literacy than as a distinctive professional hallmark in its own right.

As a contribution, this empirical research provides a descriptive snapshot of usage profiles in technocreative degree programmes and patterns of complementarity. It also identifies an instrumental acceptance of AI –perceived as useful for tasks with low ambiguity– alongside scepticism regarding complex skills. Finally, it contributes to the debate on employability by showing that AI is perceived as a cross-cutting skill rather than a differential competitive advantage in the absence of clear pedagogical mediation. The implications point towards moving from an instrumental to a strategic approach in teaching: designing higher-order activities—decision-making, argumentation, innovation, and entrepreneurship—in which AI acts as a counterpart and students are required to articulate their criteria, justify their choices, and document their verification. This should be complemented by responsible and sustained literacy (critical evaluation of sources, traceability of AI use, intellectual property, and ethics), embedded in rubrics and portfolios that evidence learning and transfer.

In the academic sphere, it would be advisable to refine adoption frameworks (e.g., extending TAM/UTAUT and related theories with constructs such as perceived functionality, resource complementarity, or higher-order outcomes as dependent variables), and to advance segmentation through multi-method approaches, including latent classes/profiles, longitudinal or quasi-experimental designs, and “objective trace” measures (portfolios, blind rubrics, usage logs) combined with qualitative techniques. From a managerial perspective, the priority is to align curriculum and employability: to define learning outcomes that integrate AI, verification, and decision-making; to accredit them through portable evidence (portfolios, micro-credentials); and to ensure their consistency with external practices and the demands of techno-creative industries.

The study is limited to a single institution and three educational fields, which restricts its generalisability. The measures are self-reported and cross-sectional, limiting the ability to infer causality or capture temporal dynamics. Moreover, rapid technological evolution may affect comparability over time.

For future research, it would be advisable to expand the sample to multiple universities (and potentially national contexts), incorporate longitudinal designs, and evaluate pedagogical interventions (e.g., projects with mandatory traceability and verification) by measuring their effects on creativity, critical thinking, and entrepreneurial intent. It may also be valuable to examine user-profile segmentations and indices of resource complementarity as predictors of academic and professional outcomes.

6. STATEMENT OF AUTHORSHIP ACCORDING TO TAXONOMY CrediT

Inna Alexeeva-Alexeev: conceptualisation; methodology; validation; formal analysis; research; resources; data curation; original draft writing; writing-reviewing and editing; visualisation; supervision; project management.

Patricia Comesaña Comesaña: conceptualisation; research; resources; data curation; writing – original draft; writing – review and editing; visualisation; supervision; project management.

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