ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: STUDENT PERCEPTIONS, ACADEMIC INTEGRITY AND CHALLENGES FOR ASSESSMENT

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ABSTRACT
This study examines university students' perceptions of generative AI to better understand digital citizenship within AI-mediated learning environments. A quantitative descriptive-comparative design was employed with a sample of 546 undergraduate students enrolled in different degree programmes at the University of Granada. Data were collected using the PEHIA-TA (Perception of Higher Education Students about the Use of Artificial Intelligence Tools in Academic Tasks) questionnaire, a previously validated instrument comprising five dimensions: AI Uses, Required Skills, Perceived Benefits, Perceived Problems, and Academic Integrity. Descriptive statistics and Kruskal–Wallis tests were conducted to analyse students' perceptions and identify differences across academic disciplines. The findings reveal that students generally hold positive perceptions of Artificial Intelligence while recognising the importance of ethical responsibility and the competencies required for its appropriate use. Academic Integrity emerged as the highest-rated dimension, highlighting students' awareness of the need for transparency, honesty, and responsible AI use in academic contexts. These findings suggest that university students' perceptions extend beyond attitudes towards a technological innovation and provide valuable evidence for understanding the emergence of responsible digital citizenship in AI-mediated higher education.

KEYWORDS
Artificial Intelligence; Digital Citizenship; Higher Education; Academic Integrity; Student Perceptions.

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1. Introduction

The rapid emergence of generative Artificial Intelligence (AI) is reshaping higher education by transforming learning, assessment and knowledge production. Unlike previous digital technologies, AI systems actively participate in cognitive processes traditionally associated with human intelligence, including reasoning, writing, creativity and problem-solving. Large Language Models and other AI applications can generate academic texts, produce computer code, summarise scientific literature and support decision-making, fundamentally altering the relationship between learners, teachers and digital technologies (Holmes et al., 2022; UNESCO, 2023; Selwyn, 2024).

This transformation extends beyond the incorporation of new technological tools. As AI becomes embedded in academic practice, universities are challenged to reconsider how knowledge is constructed, how learning should be assessed and which competencies future graduates require. Rather than replacing human learning, AI changes the educational conditions under which learning takes place, demanding pedagogical approaches that preserve critical thinking, intellectual autonomy and ethical responsibility (Baig & Yadegaridehkordi, 2024; González-Campos et al., 2024).

Current research highlights both the opportunities and challenges associated with generative AI. On the one hand, AI can enhance personalised learning, provide adaptive feedback and improve access to educational resources (Akhmadieva et al., 2024). On the other hand, concerns have emerged regarding academic integrity, excessive dependence on AI-generated content and the potential weakening of critical thinking and authentic learning (Williams, 2023; Yusuf et al., 2024). Rather than representing opposing perspectives, these debates emphasise that the educational impact of AI

depends largely on how universities integrate these technologies within appropriate pedagogical and ethical frameworks (UNESCO, 2023; INTEF, 2024).

The widespread use of generative AI also requires a profound reconsideration of assessment practices. Traditional models centred on evaluating final products become increasingly insufficient when AI systems are capable of producing sophisticated academic outputs. Consequently, recent literature advocates assessment approaches that prioritise learning processes, critical reasoning, reflection and students' ability to justify their interactions with AI (Williams, 2023; Yusuf et al., 2024). Similarly, academic integrity is progressively understood not simply as plagiarism prevention but as an ethical framework that regulates transparent and responsible collaboration between students and intelligent systems (University of Granada, 2024; UNESCO, 2023).

These transformations also redefine the competencies expected of university graduates. Beyond technical proficiency, students require multidimensional forms of AI Literacy that combine technological knowledge with critical evaluation, ethical judgement, awareness of algorithmic limitations and responsible decision-making (Southworth et al., 2023; INTEF, 2024). Consequently, traditional notions of digital competence are no longer sufficient to explain participation in AI-mediated educational environments.

From this perspective, generative AI represents not merely another technological innovation but a catalyst for rethinking the educational mission of higher education. Universities are increasingly expected to prepare graduates capable of collaborating critically and responsibly with intelligent systems while preserving human agency, academic integrity and reflective judgement. This shift suggests that existing frameworks of digital competence

and AI literacy require a broader conceptual perspective capable of explaining responsible participation in AI-mediated learning environments.

Although numerous studies have examined the applications and risks of Artificial Intelligence in higher education, limited attention has been paid to how students' perceptions reflect the emergence of new forms of digital citizenship. To address this gap, the present study analyses university students' perceptions through the “PEHIA-TA questionnaire”, a previously validated instrument comprising five complementary dimensions: “AI Uses, Required Skills, Perceived Benefits, Perceived Problems, and Academic Integrity”.

Existing conceptualisations provide important foundations for understanding students’ interactions with digital and intelligent technologies, but they address different aspects of this phenomenon. Digital citizenship frameworks traditionally emphasise responsible, ethical and participatory engagement within digital environments, including dimensions such as digital responsibility, critical engagement and appropriate participation. However, these approaches were largely developed before generative AI became capable of actively contributing to processes of writing, reasoning, content generation and academic decision-making. Consequently, they do not necessarily explain the specific forms of responsibility that emerge when students interact directly with systems capable of influencing the production of academic knowledge.

Similarly, AI literacy frameworks primarily focus on the knowledge, skills and dispositions required to understand, evaluate and use Artificial Intelligence effectively and critically. In higher education, AI literacy encompasses competencies such as understanding AI capabilities and limitations, evaluating AI-generated information, formulating appropriate prompts and making

informed decisions about AI use (Southworth et al., 2023; INTEF, 2024). While these approaches are essential for responsible AI use, AI literacy primarily addresses the competencies required to interact with AI rather than the broader educational and civic conditions under which such interaction takes place.

Responsible AI approaches and academic integrity perspectives add an important ethical dimension to this discussion. Responsible AI emphasises principles such as transparency, accountability, fairness and human oversight, whereas academic integrity traditionally focuses on honesty, authorship, attribution and responsible academic conduct. In AI-mediated educational environments, these principles increasingly intersect because students must make decisions not only about whether AI can be used, but also about when its use is educationally appropriate, how its contribution should be acknowledged, how generated information should be critically evaluated, and how human authorship and intellectual responsibility should be preserved. Thus, academic integrity represents an important ethical dimension of AI use, but it does not by itself provide a comprehensive framework for understanding students' competencies, participation and interaction with AI.

The AI-mediated University Digital Citizenship Framework (AI-UDCF) proposed in this study is positioned at the intersection of these perspectives. Rather than replacing existing conceptualisations of digital citizenship, AI literacy, responsible AI use or academic integrity, the framework seeks to connect them within the specific context of higher education and human–AI academic interaction. Its distinctive contribution lies in conceptualising university students' engagement with generative AI as simultaneously a matter of technological competence, critical awareness, responsible participation and ethical responsibility. In this sense, the AI-UDCF provides a contextual and

integrative lens through which these dimensions can be considered jointly rather than as independent aspects of AI use. The framework is therefore proposed as a conceptual model informed by the empirical dimensions assessed through the PEHIA-TA and by the existing literature, rather than as an empirically validated construct.

The relationship between the empirical dimensions assessed through the PEHIA-TA and the conceptual dimensions proposed within the AI-UDCF is summarised in Table 1. This correspondence makes explicit how the empirical findings inform the conceptual architecture of the proposed framework while maintaining a distinction between measurement and theoretical interpretation.

Table 1. Conceptual relationship between the PEHIA-TA dimensions and the AI-UDCF

PEHIA-TA empirical dimension	**AI-UDCF conceptual dimension**
AI Uses	Responsible Participation
Required Skills	AI Literacy
Perceived Benefits	Critical Awareness of AI affordances
Perceived Problems	Critical Awareness of AI limitations and risks
Academic Integrity	Ethical Responsibility

The correspondence presented in Table 1 is interpretative rather than psychometric. It illustrates how the empirical dimensions assessed through the PEHIA-TA inform the conceptual dimensions of the AI-UDCF, but it does not imply that the two structures are statistically equivalent or that the proposed framework has been empirically validated in the present study.

The framework brings together dimensions that are commonly addressed separately in research on digital citizenship, AI literacy, responsible AI use and

academic integrity, situating them within the specific context of university learning mediated by generative AI. In this sense, the AI-UDCF is intended as a conceptual framework for interpreting how students' AI-related competencies, perceptions, participation and ethical responsibilities may intersect in contemporary higher education.

Building on this theoretical positioning, the present study reinterprets the five dimensions measured by the PEHIA-TA from a broader conceptual perspective and proposes the AI-mediated University Digital Citizenship Framework (AI-UDCF). The framework brings together dimensions that are commonly addressed separately in research on digital citizenship, AI literacy, responsible AI use and academic integrity, situating them within the specific context of university learning mediated by generative AI. Rather than conceptualising digital citizenship solely in terms of participation in digital environments, the AI-UDCF considers the distinctive conditions created when students interact with AI systems that can generate content, influence reasoning and contribute to academic decision-making. In this sense, the framework is intended as a contextual and integrative lens for interpreting how students' AI-related competencies, perceptions, participation and ethical responsibilities intersect in contemporary higher education.

2. Methodology

2.1. Research Design

The present study adopted a quantitative, descriptive, comparative, and cross-sectional research design aimed at analysing university students' perceptions of the use of generative Artificial Intelligence in academic tasks and exploring potential differences across undergraduate degree

programmes.From this perspective, the study was not intended to validate a measurement instrument but rather to employ a previously validated questionnaire to examine university students' reported perceptions of the opportunities, competencies, challenges, and ethical implications associated with the use of Artificial Intelligence in higher education.

2.2. Participants

The study was conducted with a sample of 546 university students enrolled in different undergraduate degree programmes at the University of Granada (Spain).

The disciplinary diversity of the sample made it possible to analyse students' perceptions across different fields of knowledge and to explore potential differences associated with their academic background.

Participants were selected using a convenience sampling strategy, with students from a variety of academic programmes included to allow descriptive and comparative analyses across degree programmes.

Participation was voluntary and anonymous. Throughout the research process, the ethical principles governing educational research were fully respected, and the confidentiality of all information provided by participants was guaranteed.

The study was conducted at a single higher education institution, the University of Granada (Spain).

2.3. Instrument

Data were collected using the PEHIA-TA (Perception of Higher Education Students about the Use of Artificial Intelligence Tools in Academic Tasks) questionnaire, a previously validated instrument designed to assess university students' perceptions of the use of Artificial Intelligence in academic contexts (Crisol-Moya, Romero, & Gámiz-Sánchez, 2026).

The questionnaire comprises five complementary dimensions: AI Uses, Required Skills, Perceived Benefits, Perceived Problems, and Academic Integrity. Together, these dimensions provide a multidimensional perspective on students' interactions with Artificial Intelligence by integrating functional, pedagogical, and ethical aspects of AI use.

The instrument was developed following a systematic review of the literature on Artificial Intelligence, higher education, digital literacy, and academic integrity. Item development was based on criteria of conceptual clarity and educational relevance and was subsequently refined through expert judgement involving specialists in higher education and educational measurement.

The psychometric quality of the questionnaire was established through a comprehensive validation process that included content validation, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and internal consistency analyses. The results confirmed a stable five-factor structure with satisfactory indices of validity and reliability (KMO = 0.909; RMSEA = 0.0545; CFI = 0.959; Cronbach's α = 0.902), supporting its suitability for analysing university students' perceptions of Artificial Intelligence in higher education. Accordingly, the PEHIA-TA provides a validated and reliable

basis for examining university students' reported perceptions of the educational, competency-related, and ethical implications of generative AI.

As the PEHIA-TA is a self-report questionnaire, the data collected in the present study reflect participants' reported perceptions and attitudes towards AI use rather than directly observed academic practices or behaviours.

2.4. Procedure

Data collection was carried out through the administration of the PEHIA-TA questionnaire to university students enrolled in different undergraduate degree programmes. Once the data collection process had been completed, responses were coded and statistically analysed in order to describe students' perceptions and examine the existence of significant differences across academic programmes.

2.5. Data Analysis

Statistical analyses were conducted at two complementary levels. First, descriptive analyses were performed to characterise students' perceptions across each of the five dimensions measured by the questionnaire. Subsequently, the Kruskal–Wallis non-parametric test was applied to examine statistically significant differences among undergraduate degree programmes. In addition, effect sizes were calculated to assess the magnitude of the observed differences. All statistical analyses were conducted using procedures appropriate to the level of measurement of the variables and the characteristics of the sample.

3. Main Results

3.1. Overall Overview of Students' Perceptions

Following the psychometric validation of the PEHIA-TA questionnaire, descriptive analyses were conducted across the five dimensions comprising the instrument in order to examine university students' perceptions of the use of Artificial Intelligence in academic tasks.

Overall, the findings indicate a positive perception of Artificial Intelligence, accompanied by a similarly high awareness of the ethical responsibilities associated with its use. The mean scores obtained suggest that students do not perceive AI merely as a technological tool but rather as an educational resource whose effective use requires specific competencies and critical reflection on its academic implications.

Table 2: Descriptive Results for the PEHIA-TA Dimensions

Dimension	Mean	Standard Deviation	Level of Assessment
Academic Integrity	**3.79**	0.746	Very High
Required Skills for AI Use	**3.64**	0.809	High
AI Uses	**3.61**	0.906	High
Perceived Benefits of AI	**3.49**	0.723	Moderately High
Perceived Problems of AI	**3.05**	1.110	Moderate

The results indicate that Academic Integrity received the highest mean score, whereas Perceived Problems of AI obtained the lowest. This finding suggests that students attach considerable importance to the ethical implications of

Artificial Intelligence while simultaneously maintaining a balanced perception of both its educational benefits and its potential risks.

3.2. Dimension 1. AI Uses

The AI Uses dimension examines students' familiarity with Artificial Intelligence tools and the frequency with which they employ these technologies in academic activities.

The mean scores obtained indicate that, in their reported perceptions, students view AI not merely as a technological tool but as an educational resource whose use involves specific competencies and consideration of its academic implications.

However, subsequent analyses reveal that this dimension presents statistically significant differences across degree programmes, indicating that the level of AI use is not homogeneous across academic disciplines. The relatively high score obtained for this dimension further suggests that Artificial Intelligence is no longer perceived as an emerging technology but rather as a well-established academic resource.

This finding highlights the relevance of considering AI use as an established element of contemporary university learning when designing educational and institutional responses.

3.3. Dimension 2. Required Skills for AI Use

The second dimension evaluates the competencies that students consider necessary for the effective use of Artificial Intelligence tools.

The mean score reached 3.64, making it one of the highest-rated dimensions of the questionnaire.

This result demonstrates that students recognise that the effective use of Artificial Intelligence requires considerably more than technical knowledge alone. From their perspective, working with AI tools involves developing competencies related to information retrieval, prompt formulation, critical evaluation of AI-generated responses, and the responsible use of generated outputs. The findings therefore suggest that students perceive AI literacy as a cross-cutting competence that is increasingly necessary for successful participation in contemporary higher education.

This result represents one of the strongest arguments supporting the incorporation of specific AI literacy programmes into university curricula, enabling students to acquire not only technical abilities but also the critical and ethical competencies required for responsible interaction with intelligent systems.

3.4. Dimension 3. Academic Integrity

The Academic Integrity dimension obtained the highest mean score among all the dimensions of the instrument (M = 3.79). This result indicates that students place substantial importance on ethical considerations associated with the use of Artificial Intelligence in academic contexts. The dimension addresses issues such as authorship, academic honesty, and responsible use of AI tools, which were therefore highly represented in students' reported perceptions.

Because these data are self-reported, however, the high score should be interpreted as an indication of students' reported ethical attitudes and perceptions rather than as direct evidence of their actual academic behaviour or compliance with academic integrity principles. The finding nevertheless highlights the relevance that students attribute to ethical considerations in the context of AI-supported academic practices and may inform institutional approaches to transparent and responsible AI use.

3.5. Dimension 4. Perceived Benefits

The Perceived Benefits dimension achieved a mean score of 3.49. Students recognise that Artificial Intelligence can facilitate learning, improve academic productivity, and support the completion of a wide range of educational tasks.

However, the score obtained is slightly lower than those observed for the dimensions related to Required Skills and Academic Integrity. This finding suggests that although students maintain a positive perception of Artificial Intelligence, this positive attitude is accompanied by a cautious evaluation of its actual educational potential. Artificial Intelligence is therefore perceived as a valuable educational resource, but not as a substitute for meaningful learning or individual intellectual effort.

3.6. Dimension 5. Perceived Problems

The Perceived Problems dimension obtained the lowest mean score among the five dimensions (M = 3.05). Although students acknowledge the existence of potential risks associated with the use of Artificial Intelligence, these concerns appear to be less prominent than the educational opportunities

offered by AI or the ethical issues related to its responsible use. This result may therefore be interpreted as reflecting a relatively balanced perception of Artificial Intelligence. Students recognise the limitations and possible risks associated with these technologies; however, such concerns do not outweigh their generally positive assessment of AI as a valuable educational resource.

3.7. Comparison Across Degree Programmes

To determine whether students' perceptions differed according to their academic programme, the Kruskal–Wallis non-parametric test was applied. The results indicate that only two of the five dimensions present statistically significant differences across degree programmes.

Table 3: Differences Across Degree Programmes (Kruskal–Wallis Test)

Dimension	χ^2	p	Interpretation
AI Uses	**16.614**	**< .001**	Significant differences
Required Skills	**7.822**	**.020**	Significant differences
Perceived Benefits	**0.194**	**.907**	Not significant
Perceived Problems	**1.562**	**.458**	Not significant
Academic Integrity	**1.037**	**.595**	Not significant

The effect sizes obtained were small ($\varepsilon^2 = 0.030$ for AI Uses and $\varepsilon^2 = 0.014$ for Required Skills), indicating that although statistically significant differences exist across degree programmes, their practical magnitude remains limited. From an educational perspective, these effect sizes indicate that the statistically significant differences associated with degree programme should not be interpreted as evidence of substantial differences in students' overall perceptions. The ε^2 values suggest that degree programme accounts for only a

small proportion of the variability in reported perceptions of AI Uses and Required Skills. Consequently, although academic background appears to be associated with some differences in students' reported engagement with AI and perceived competency requirements, the magnitude of these differences is limited and should be interpreted alongside the generally high scores observed across the sample. For the remaining dimensions, the effect sizes were virtually negligible ($\varepsilon^2 < 0.003$), indicating that differences associated with degree programme account for very little variability in students' reported perceptions of AI benefits, problems, and academic integrity. Notably, Academic Integrity did not differ significantly across degree programmes ($p = .595$), suggesting that the high level of importance attributed to this dimension was relatively consistent across the academic groups represented in the sample. From an educational perspective, this pattern points to a relatively consistent set of perceptions across the degree programmes represented in the sample, although it should not be interpreted as evidence that students from all disciplines hold identical views.

4. Discussion

4.1. From Instrument Validation to Understanding AI-mediated University Digital Citizenship

The rapid adoption of generative Artificial Intelligence has created an urgent need to understand how university students integrate these technologies into their academic practices. While most research has focused on AI applications or ethical challenges, less attention has been paid to how students'

perceptions reflect new forms of participation in AI-mediated learning environments (Holmes et al., 2022; Tlili et al., 2023; UNESCO, 2023).

In this context, the present study moves beyond the psychometric validation of the "PEHIA-TA questionnaire" by reinterpreting its five dimensions as indicators of a broader educational phenomenon. Rather than functioning solely as psychometric constructs, "AI Uses, Required Skills, Perceived Benefits, Perceived Problems, and Academic Integrity" collectively provide evidence of how students understand their roles, responsibilities, and competencies in higher education increasingly shaped by collaboration with intelligent systems.

The conceptual contribution of the present study does not consist in introducing new isolated dimensions of AI use, as the relevance of AI literacy, responsible AI use, critical awareness and academic integrity has already been recognised in previous research. Rather, the contribution lies in bringing these dimensions together within a higher education-specific framework focused on students' participation in AI-mediated academic environments. The AI-UDCF therefore provides an integrative conceptual lens for interpreting the relationships between what students do with AI, the competencies they perceive as necessary, the benefits and problems they associate with its use, and the ethical responsibilities they attribute to AI-supported academic practices.

This positioning differentiates the AI-UDCF from approaches that primarily emphasise either digital participation, AI-related competencies, responsible technological development or academic misconduct. The framework instead places the student at the centre of the AI-mediated educational relationship and conceptualises responsible participation as emerging from the interaction between functional AI use, AI-related competencies, critical awareness and

ethical responsibility. The framework should nevertheless be understood as a theoretically informed conceptual proposal rather than as an empirically validated model. Its empirical examination requires future studies using dedicated measures, different institutional contexts and research designs capable of testing the proposed relationships among its dimensions.

From the perspective of the proposed AI-mediated University Digital Citizenship Framework (AI-UDCF), the findings can be interpreted as informing the proposed conceptualisation of students' participation in AI-mediated learning environments. The PEHIA-TA dimensions provide an empirical basis from which to discuss students' reported uses of AI, perceived competencies, perceived benefits and problems, and academic integrity concerns. However, these findings should not be interpreted as empirical validation of the AI-UDCF itself. Rather, they illustrate how the dimensions measured by the PEHIA-TA can be theoretically connected to the broader conceptual dimensions of the framework, which integrates technological, pedagogical and ethical considerations of AI-mediated participation (Selwyn, 2024; Baig & Yadegaridehkordi, 2024).

The effect-size results provide an important qualification to the statistically significant differences observed across degree programmes. Although AI Uses and Required Skills differed significantly by academic programme, the corresponding effect sizes were small ($\varepsilon^2 = 0.030$ and $\varepsilon^2 = 0.014$, respectively). This indicates that the statistical differences explain only a limited proportion of the variability in students' reported perceptions and should therefore not be interpreted as evidence of substantial educational differences between disciplinary groups. From an educational perspective, the findings suggest that AI-related experiences and perceived competency requirements may vary somewhat according to academic context, but that these differences are

relatively modest within the present sample. Conversely, the negligible effect sizes observed for Perceived Benefits, Perceived Problems, and Academic Integrity indicate that these perceptions were comparatively consistent across the degree programmes represented in the study.

4.2. Students' Perceptions as Indicators of Responsible Participation

One of the most significant findings of the present study is that university students' perceptions reveal a balanced and reflective understanding of generative Artificial Intelligence rather than either unconditional enthusiasm or technological rejection. This result is particularly relevant because public and academic debates surrounding AI have often been characterised by polarised narratives, oscillating between highly optimistic expectations regarding educational innovation and concerns about academic misconduct, loss of critical thinking and the erosion of authentic learning (Selwyn, 2024; Holmes et al., 2022).

The descriptive analyses obtained through the PEHIA-TA questionnaire indicate that students simultaneously recognise the educational potential of AI, the competencies required for its effective use and the ethical responsibilities associated with its implementation. Rather than perceiving these dimensions as independent, students appear to integrate them into a coherent understanding of responsible AI use. This finding suggests that learners do not approach AI merely as a productivity-enhancing technology but increasingly regard it as a resource whose educational value depends on informed, critical and ethically grounded decision-making.

This interpretation aligns with recent international frameworks on AI literacy, which increasingly define competence in Artificial Intelligence as extending beyond technical proficiency. Contemporary approaches emphasise that

effective AI use requires the integration of operational knowledge, critical evaluation, ethical awareness and reflective judgement (Southworth et al., 2023; UNESCO, 2023; INTEF, 2024). The present findings reinforce this perspective by demonstrating that students themselves acknowledge the multidimensional nature of AI-supported learning and recognise that technological effectiveness cannot be separated from ethical responsibility.

From the perspective of the proposed AI-mediated University Digital Citizenship Framework (AI-UDCF), these perceptions constitute empirical indicators of what we define as Responsible Participation. This concept extends traditional notions of digital citizenship by recognising that participation in contemporary higher education no longer occurs exclusively through interaction with digital resources or online communities but increasingly involves continuous collaboration with intelligent systems capable of influencing reasoning, creativity and academic decision-making.

Responsible participation therefore implies more than appropriate technological behaviour. It encompasses students' capacity to determine when AI support is educationally appropriate, critically evaluate AI-generated outputs, preserve intellectual autonomy and assume responsibility for the decisions made throughout the learning process. In this sense, responsible participation represents the practical expression of digital citizenship in AI-mediated educational environments.

Importantly, the relatively balanced perceptions identified in this study also challenge deterministic interpretations of Artificial Intelligence. Students neither idealise AI as a universal solution nor perceive it exclusively as a threat to academic integrity. Instead, they demonstrate an awareness of both its opportunities and limitations. Such balanced perceptions are particularly valuable because recent research has highlighted that responsible AI adoption

depends not only on technological access but also on users' capacity to critically interpret the affordances and constraints of intelligent systems (Baig & Yadegaridehkordi, 2024; UNESCO, 2023).

From an educational perspective, these findings suggest that universities should move beyond binary discourses centred on either promoting or restricting AI use. Rather, institutional efforts should focus on cultivating students' capacity to participate responsibly within AI-mediated learning environments. This requires educational strategies that simultaneously promote technical competence, critical reflection, ethical reasoning and transparency regarding AI-supported academic practices.

Consequently, the present findings support the argument that students' perceptions should not be interpreted merely as attitudes towards a technological innovation. Instead, they constitute valuable evidence of how university learners are beginning to construct new forms of educational participation that integrate Artificial Intelligence into their academic practices while preserving human agency, critical thinking and ethical responsibility. Within the AI-mediated University Digital Citizenship Framework (AI-UDCF), these perceptions therefore represent observable manifestations of responsible participation and provide empirical support for understanding digital citizenship as an evolving educational construct shaped by human–AI collaboration.

4.3. Academic Integrity as the Ethical Core of AI-mediated University Digital Citizenship

One of the most significant findings of the present study is that Academic Integrity received the highest mean score among all five dimensions

measured by the PEHIA-TA questionnaire. Beyond its statistical relevance, this result has important conceptual implications because it suggests that students perceive the ethical dimension of Artificial Intelligence as a central component of its educational use. Rather than approaching AI exclusively as a technological resource capable of improving academic performance, participants recognise that its incorporation into higher education inevitably raises questions concerning honesty, authorship, transparency and personal responsibility.

The findings therefore suggest that academic integrity deserves sustained attention within institutional approaches to AI-supported learning and assessment. Rather than being considered solely in relation to misconduct prevention, it can also be incorporated into educational approaches that promote transparency, responsible AI use and student accountability. Within the AI-UDCF, the Academic Integrity dimension of the PEHIA-TA is therefore interpreted as informing the Ethical Responsibility component of the framework, alongside Responsible Participation, AI Literacy and Critical Awareness. (Holmes et al., 2022; UNESCO, 2023).

Recent international literature increasingly argues that the ethical challenges posed by generative AI cannot be addressed exclusively through surveillance technologies or plagiarism detection systems. Instead, universities are encouraged to move towards educational models that promote transparency, responsible disclosure and critical reflection regarding the role of AI in knowledge production (Williams, 2023; Yusuf et al., 2024). This perspective shifts the focus from detecting inappropriate AI use to cultivating ethical decision-making capable of guiding students' interactions with intelligent systems.

The present findings are consistent with this educational perspective.The prominence of the Academic Integrity dimension, which received the highest mean score, indicates that students place substantial importance on ethical considerations associated with AI use.Importantly, this recognition emerges despite the rapid diffusion and normalisation of AI technologies across university contexts. The finding therefore suggests that ethical considerations remain salient in students' perceptions of AI-supported academic practices.From this perspective, academic integrity may be understood not only as a mechanism for addressing misconduct but also as an educational dimension that can guide transparent and responsible human–AI collaboration.While responsible participation describes students' capacity to engage critically with Artificial Intelligence, academic integrity establishes the normative principles governing that participation. Together, these dimensions ensure that collaboration with intelligent systems remains compatible with intellectual honesty, educational authenticity and meaningful learning.

This interpretation extends existing conceptualisations of digital citizenship. Classical models have emphasised ethical online behaviour, respectful communication and responsible participation within digital communities. Although these dimensions remain essential, AI-mediated educational environments require an expanded understanding of ethical responsibility. Students must now make informed decisions concerning when AI support is appropriate, how AI-generated contributions should be acknowledged, and how to preserve personal authorship while benefiting from technological assistance. Consequently, academic integrity evolves from a reactive mechanism focused on misconduct prevention into a proactive educational competence that guides human–AI collaboration.

This reconceptualisation is consistent with recent institutional developments. International organisations and higher education institutions are increasingly replacing restrictive approaches with governance models that emphasise transparency, responsible AI use and institutional guidance (UNESCO, 2023; INTEF, 2024; University of Granada, 2024). These initiatives recognise that ethical AI integration depends less on technological control than on cultivating a culture of responsibility shared by students, teachers and institutions.

The findings of this study therefore suggest that academic integrity should occupy a central position within future AI governance strategies in higher education. Rather than functioning solely as an assessment principle, it should be understood as one of the core educational values shaping university digital citizenship. Within the AI-mediated University Digital Citizenship Framework (AI-UDCF), Academic Integrity represents the ethical foundation upon which the remaining dimensions—Responsible Participation, AI Literacy and Critical Awareness—are articulated. Without ethical responsibility, technical competence alone is insufficient to ensure meaningful and socially responsible participation in AI-mediated educational environments.

These findings are therefore consistent with an educational approach in which academic integrity is addressed not only through restrictions or detection mechanisms, but also through the development of students' capacity to engage with AI transparently, critically and responsibly.

4.4 Implications for Assessment in AI-Mediated Higher Education

The findings also have implications for the design of assessment in higher education. The relatively high scores obtained for AI Uses, Required Skills, and Academic Integrity suggest that students recognise both the increasing presence of AI in academic practices and the need for competencies and

ethical considerations when using these technologies. From this perspective, assessment practices may need to move beyond approaches based exclusively on the final product and place greater emphasis on how students develop, justify, and communicate their learning.

First, the findings support greater consideration of authentic assessment approaches that require students to apply knowledge to meaningful, contextualised, or discipline-specific situations. Tasks that require interpretation, problem-solving, decision-making, reflection, or the application of knowledge to novel contexts may provide opportunities to assess students' individual understanding while also allowing AI to be incorporated transparently where pedagogically appropriate. In this context, the purpose is not necessarily to exclude AI from assessment but to design tasks in which meaningful learning cannot be reduced to the production of a generic AI-generated response.

Second, AI-supported assessment may be considered as an additional pedagogical possibility when its use is aligned with the learning objectives and accompanied by appropriate human oversight. AI tools can support formative feedback, generate alternative explanations, facilitate practice, or assist students and teachers in identifying areas for improvement. However, the use of AI in assessment should remain subordinate to the intended learning outcomes, with human judgement retained in decisions concerning students' achievement.

Third, the findings point towards greater attention to process-oriented assessment. If generative AI can contribute to the production of academic outputs, evaluating only the final product may provide limited information about how students arrived at their answers or developed their understanding. Assessment strategies that incorporate drafts, revisions,

reflective commentaries, oral explanations, portfolios, project documentation, or other evidence of learning processes may provide a more comprehensive view of students' learning and of their capacity to use AI critically and responsibly.

Fourth, transparency should become an explicit component of AI-mediated assessment. Students may be asked to disclose when and how AI tools have been used, identify the purposes for which they were employed, and critically evaluate their contribution to the final work. Such practices can help distinguish between the use of AI as a learning support and the delegation of the intellectual work that the assessment is intended to evaluate. Transparency can therefore contribute to academic integrity while also supporting students' development of responsible AI practices.

Finally, these implications extend beyond individual assessment practices to institutional assessment policies. Universities may need to provide clearer and more consistent guidance regarding acceptable and unacceptable uses of generative AI in different types of assessment, while recognising that appropriate uses may vary according to disciplinary context and learning objectives. Institutional policies should therefore combine academic integrity requirements with educational guidance on AI literacy, transparency, responsible participation, and assessment design. Rather than relying exclusively on detection or prohibition, a coherent institutional approach can establish shared expectations for students and teachers regarding the appropriate role of AI in academic assessment.

5. Conclusions

The integration of generative Artificial Intelligence into higher education represents one of the most significant transformations affecting universities, reshaping learning, assessment, knowledge construction, and the competencies required of future graduates. This study employed the PEHIA-TA questionnaire, a previously validated instrument, to analyse university students' perceptions of Artificial Intelligence in academic contexts. The findings show that students generally hold positive attitudes towards AI while recognising the competencies and ethical responsibilities required for its appropriate use.

The results further highlight that effective AI adoption requires competencies extending beyond technical proficiency, including critical thinking, evaluation of AI-generated information, prompt design, and reflective decision-making. These findings support the integration of AI literacy programmes into higher education curricula and reinforce the need to redesign assessment practices and institutional policies in response to AI-mediated learning environments. Methodologically, the PEHIA-TA provides a robust multidimensional instrument for analysing students' perceptions across five complementary dimensions, facilitating comparative and longitudinal research on the educational impact of Artificial Intelligence. Beyond its methodological contribution, this study argues that students' perceptions offer valuable evidence for understanding the emergence of a new form of AI-mediated University Digital Citizenship. From this perspective, Artificial Intelligence should be regarded not simply as a technological innovation but as a structural component of contemporary higher education that requires

universities to foster responsible participation, critical awareness, AI literacy, and ethical responsibility.

Future research should extend the application of the PEHIA-TA across different institutional, disciplinary, and cultural contexts to examine how university digital citizenship evolves as Artificial Intelligence becomes increasingly embedded in teaching and learning.

6. Limitations and Future Research

Several methodological limitations should be considered when interpreting the findings. First, the quantitative, descriptive, and cross-sectional design provides a snapshot of students' reported perceptions at a particular point in time. Consequently, the findings cannot establish causal relationships between students' characteristics, AI use, and their perceptions. Longitudinal and experimental or quasi-experimental designs could provide stronger evidence regarding changes over time and potential explanatory relationships.

Second, participants were recruited through convenience sampling from a single higher education institution, the University of Granada. Although the sample included students from different undergraduate degree programmes, this sampling strategy limits the representativeness of the sample and the extent to which the findings can be generalised to other university populations, institutions, or educational contexts. Future research should therefore incorporate probability-based or more systematically stratified sampling strategies and include multiple institutions and diverse geographical and disciplinary contexts.

Third, the study relied on self-reported data collected through the PEHIA-TA questionnaire. The findings consequently reflect students' perceptions and reported attitudes towards AI rather than their objectively observed academic practices or behaviours. This limitation is particularly relevant to the interpretation of the Academic Integrity dimension, whose high scores should not be understood as direct evidence of students' actual ethical conduct or compliance with academic integrity policies. Future studies could complement self-report measures with behavioural indicators, qualitative evidence, assessment artefacts, or other forms of triangulation.

Finally, although the PEHIA-TA provides a validated multidimensional measure of students' perceptions, the present study did not directly measure the four conceptual dimensions of the proposed AI-UDCF. The relationships established between the empirical dimensions of the PEHIA-TA and the conceptual dimensions of the AI-UDCF are therefore interpretative rather than psychometric. Future research should develop and validate dedicated measures of the AI-UDCF and examine its proposed relationships across different institutional and educational contexts.

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