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RESEARCH ARTICLE

Benefits and Challenges of AI in Higher Distance Education: Students' Perceptions and Practices in Hellenic Open University (HOU)

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Abstract: This study explores postgraduate students' perceptions and practices regarding Artificial Intelligence (AI) tools in distance education at the Hellenic Open University (HOU). Conducted over two academic years (2023–24 and 2024–25), it examines students' familiarity with AI, perceived benefits and challenges, and opinions on ethical integration. Quantitative data were gathered via an online questionnaire from a sample of 373 students enrolled in two M.Sc. programmes. Results show that although students are somewhat familiar with AI, actual usage remains limited, mainly due to a lack of necessity, inadequate training, and institutional support. Those who use AI report benefits in research efficiency, time management, and feedback. However, concerns about reliability, academic integrity, and ethical ambiguity remain. Students strongly support establishing a regulatory framework, providing training for both students and educators, and modifying curricula to promote responsible use. The study underlines the importance of institutional preparedness and critical digital literacy as key factors for effective AI integration. Implications for educational practice, policy development, and future research are discussed, emphasising the need for a balanced, ethical, and pedagogically sound approach to AI in distance learning.

Keywords: artificial intelligence, generative AI, distance education, Hellenic Open University, technological innovation, ethical issues

1 Introduction

Artificial Intelligence (AI) - once the domain of science fiction and academic speculation, has become a tangible reality in the modern world, quietly yet profoundly shaping every aspect of human life. Particularly in education, and especially in higher distance education, the increasing influence of AI together with new instructional designs and technologies seems to signal a major shift: the 'classical' and often dominant model of knowledge transfer is diminishing, making way for a new, more fluid, flexible, and personalised learning environment that appears to foster a new 'ecosystem' of learning.

The academic community's interest in the coexistence and integration of AI and education is increasing rapidly (Bozkurt et al., 2024). Meanwhile, the constant and turbulent development of new digital applications continues to disrupt familiar data, creating an unstable landscape. The ongoing introduction of innovative, multi-dimensional digital tools to lecturers and students offers new opportunities, broadening their perspectives but also raises ambiguities and concerns about the authenticity of learning, autonomous thinking, and the ethical use of technology.

Generative AI, driven by applications like ChatGPT and other advanced language models, provides students with opportunities that until recently seemed impossible: instant access to and processing of information, automated feedback, and assistance with complex cognitive tasks (Kostas et al., 2025). Teachers, in turn, can develop much quicker, more flexible, and highly personalised learning environments (Kostas et al., 2024). However, behind the enthusiasm, complex and challenging questions arise: How does AI affect academic integrity? What are the limits of authenticity in this new era of human-machine interaction?

This paper aims to explore, using a multi-dimensional approach that combines primary research and analysis of current international literature, how AI applications are used in distance education for students at the Hellenic Open University. The goal is not only to document the methods of utilisation and practices being implemented but also to critically assess the

perspectives and risks emerging for education, especially for distance learning, in a world where the boundaries between human and artificial are becoming increasingly blurred.

1.1 The Use of AI in Distance Education

The integration of artificial intelligence into distance education, especially over the past two years, is no longer a slow-growing trend but now the foundation of a new, multifaceted, and complex reality. Unlike earlier technological shifts that gradually permeated academic environments, AI, operating subtly yet decisively, is dramatically transforming both teaching methods and the very concept of learning and knowledge.

Twenty-two (22) articles published in IRRODL, EURODL, and Open Praxis journals between 2023 and 2025 were examined in this review. The selection focused solely on studies exploring the role of productive AI in distance education. The analysis reveals that eight (8) studies employed quantitative data analysis methods (Aydemir & Seferoğlu, 2024; Duan & Zhao, 2024; Estrada-Molina et al., 2024; Hanshaw et al., 2024; He, 2024; Ibrahim & Kirkpatrick, 2024; Ma et al., 2024; Ouyang et al., 2024), eight (8) utilised qualitative exploratory approaches (Aldawsari & Almohish, 2024; Durak et al., 2024; Karatas & Yüce, 2024; Kohen-Vacs et al., 2024; L'Enfant, 2024; Lowenthal et al., 2024; Ossiannilsson et al., 2024; Ullmann et al., 2024), while six (6) adopted mixed or theoretical-synthetic methods (Bozkurt et al., 2024, 2025; Filo et al., 2024; Gesser-Edelsburg et al., 2024; Rampelt et al., 2023; Wu et al., 2024), reflecting the methodological diversity and complexity present in the field.

The research projects also varied in terms of sample and scope:
(1) Studies for undergraduate and postgraduate students, mainly in the fields of English Literature, Pedagogy, Educational Technology and Social Sciences.
(2) Surveys of teachers and academic staff members regarding the integration of AI tools in their teaching models.
(3) Specific studies of preservice teachers, exploring attitudes and concerns about the ethical use of new technologies (Karataş & Yüce, 2024).

Overall, these approaches demonstrate that AI has a multi-layered influence: from personalising learning and encouraging self-regulation to rethinking ethical boundaries and developing new types of academic relationships. Equally significant are concerns about access equality, the preservation of critical thinking, and the importance of building critical literacy as a counterbalance to seamless technological integration. In Wu et al., (2024) research, which focuses on English as a Foreign Language students in China, a matrix of factors influencing the intention to use AI tools emerged: perceived usefulness and ease of use act as strong positive drivers, while concerns regarding the accuracy of the information produced and the ethical uncertainties of technological mediation also arise. This finding emphasises the urgent need to boost critical literacy and promote responsible, reflective integration of AI in distance learning.

At the same time, the study by Ouyang et al. (2024) offers another perspective, emphasising the positive effects of using AI applications like Duolingo: their integration not only increases students' willingness to communicate actively but also significantly enhances participation levels in online classes. This demonstrates in practice the potential of AI to foster interaction and enrich the learning experience in the digital environment.

According to The Manifesto for Teaching and Learning in a Time of Generative AI by Bozkurt et al. (2024), generative AI can act as a catalyst for academic performance, personalised learning, and boosting students' digital autonomy. However, as Durak et al. (2024) highlight through their bibliometric analysis, along with Aydemir and Seferoğlu (2024), who examine user attitudes towards AI in distance education, and Hanshaw et al. (2024), who investigate the impact of AI assistants on students' learning experiences, its integration presents complex challenges: risks of over-reliance, ethical concerns, and fears of undermining critical thinking and authenticity in learning. As Ibrahim and Kirkpatrick's (2024) research indicates, using ChatGPT in an English as a foreign language learning context provides significant support to students but also requires careful pedagogical planning to prevent it from replacing creative expression and critical thinking. A similar concern is also noted by Karataş and Yüce (2024), who, focusing on student teachers, emphasise that AI is seen as a powerful tool for enhancing learning but also as a major concern regarding data integrity, ethics, and the long-term independence of academic practice.

It becomes clear, therefore, that the challenge for the academic community is not merely technical skill in the use of AI; it is the development of a new pedagogical mindset capable of critically, creatively, and ethically managing this complex learning ecosystem.

1.2 Trends and Perspectives of AI in Distance Education

The 21st century is characterised not only by the rapid pace of technological progress but also by AI shifting from a distant promise to a central part of today's reality. Specifically in distance education, AI is no longer just supplementary support; it is increasingly becoming a core element of the educational experience itself.

Analysis of articles from IRRODL, EURODL, and Open Praxis journals shows that the trend of integrating productive AI into distance learning environments is widespread. Most research focuses on shifting from using AI as a support tool to its institutional and organic integration into the design and delivery of learning experiences (Bozkurt et al., 2024; Durak et al., 2024). The study by Ma et al. (2024) similarly advances in this direction. It highlights the cross-cultural complexity involved in integrating AI into higher education. The findings reflect a generally positive attitude among students, regardless of cultural background, towards incorporating artificial intelligence tools into their academic practices.

Despite the apparent acceptance, some individual objections still remain. Concerns about the accuracy of information from these tools and ethical issues hinder their smooth adoption. The focus is on AI functions that customise learning to students' needs, enable flexible and personalised assessment, and support the implementation of 'intelligent' digital frameworks that fundamentally reshape educational infrastructure. These mechanisms are becoming more integrated into the daily operations of e-learning institutions. Nevertheless, this integration is neither straightforward nor advantageous. As Ossiannilsson et al. (2024) emphasise, the rapid proliferation of AI tools exposes a complex web of challenges: rising inequalities of access, deficiencies in ethical regulatory frameworks, risks of over-reliance on mechanical feedback for students, and concerns regarding the very authenticity of the learning process.

Remarkably, the surveys reviewed involved both undergraduate and postgraduate students as samples, mainly from fields such as teaching, linguistics, English language learning, and educational technology (Duan & Zhao, 2024; Wu et al., 2024). They also included teachers from various disciplines and asked them to integrate new technologies into their teaching models (Kohen-Vacs et al., 2024). Additionally, several studies (*e.g.*, Filo et al., 2024; L'Enfant, 2024; Ullmann et al., 2024) explored the psychological and emotional dimensions of interaction with AI tools, with findings indicating that their use can boost students' self-esteem and sense of cognitive autonomy, particularly when embedded in critically and thoughtfully designed pedagogical contexts that are verified for accuracy, appropriateness, and adapted as necessary (Ullmann et al., 2024), with an emphasis on ethical use (Filo et al., 2024). As Catalano (2018) has already pointed out, investigating these dimensions empirically requires the use of reliable psychometric tools that validly measure students' engagement, self-regulation, and perceptions in distance learning environments.

Simultaneously, the literature highlights a significant shift: from the instrumental use of AI, restricted to text creation and processing, to a more structural deployment of AI for developing "smart" learning pathways and personalised guidance. However, as the bibliometric analysis by Durak et al. (2024) indicates, vigilance is required to prevent the decline of critical thinking and creative synthesis in favour of mechanistic knowledge reproduction.

Furthermore, according to the systematic review by Estrada-Molina et al. (2024), progress in using deep learning and productive AI in open and distance education shows that, although technological development is rapid, the significant transformation of pedagogical practice remains uneven and varied, with notable differences in the quality and range of applications.

As demonstrated by Aldawsari and Almohish (2024), the indiscriminate use of AI tools by students in distance education can lead to new threats, such as inadequate digital skills development, mechanical reproduction of content, and the weakening of authentic cognitive engagement. Their study emphasises the importance of adopting critical pedagogical practices that encourage responsible and creative use of AI. AI, therefore, cannot be viewed solely as a technical tool. Instead, it emerges as a new, dynamic factor that influences pedagogical relationships, motivation, and the very essence of the educational experience. The challenge is not just to adopt technology successfully, but to develop a pedagogical ethos capable of critically, responsibly, and creatively managing this significant transformation.

1.3 The Role of AI in Distance Education

At a time when technology is rapidly expanding the boundaries of what is possible, AI is emerging in distance education not just as a facilitation tool but as a catalyst for deeper

educational transformation. It no longer operates on the sidelines; it intervenes dynamically, challenging and redefining the very nature of knowledge, the teacher, and the subject of learning. Bozkurt et al. (2025) in "Mapping Minds in Motion: a Scholarly Voyage and Evaluation of Research Trends and Patterns in Open Praxis" present a systematic and critical approach to research trends and thematic patterns in the Open Praxis journal during the period 2023-2024, analysing 81 articles registered in the Web of Science database. They find a significant increase in publications, especially collaborative ones and those with multiple authors. Furthermore, as the most important and frequent fields of study, they mention openness with a focus on Open Educational Resources (OER) and Open Educational Practices (OEP), technology-enhanced Open and Distance Learning (ODL) practices with the integration of digital technologies, innovations in e-learning, and emerging debates around Human-Artificial Intelligence (AI) symbiosis.

At the level of direct operations, AI's potential for personalised teaching, automated feedback, and adaptive assessment is impressive. Research such as Aldawsari and Almohish (2024), Duan and Zhao (2024), Lowenthal et al. (2024), Kohen-Vacs et al. (2024), demonstrates that AI systems, by utilising dynamic student performance data, can create flexible learning environments that adapt to student needs, enhancing the sense of autonomy and the effectiveness of the educational process. Furthermore, AI tools such as ChatGPT or Automated Writing Evaluation (AWE) can enhance second language (L2) writing instruction by providing immediate, personalised feedback. This approach, which offers flexibility and real-time responses, appears to be linked to students' willingness and intrinsic motivation to write, engage with joy, interest, and enjoyment of the process (Aydemir & Seferoğlu, 2024; Hanshaw et al., 2024; He, 2024; Karatas & Yüce, 2024; Ouyang et al., 2024).

An important positive outcome of using AI tools is that they can help improve time management by lowering the preparation time and administrative workload for teachers. This allows more time to focus on creative teaching activities such as enriching instructional methods and developing better lesson plans, where human involvement remains vital for composition, supervision, and proper formatting (Ibrahim & Kirkpatrick, 2024; Karatas & Yüce, 2024; Ullmann et al., 2024), as well as ongoing reflection (L'Enfant, 2024). Additionally, effective AI (GenAI) tools can enhance the work of distance learners in their assignments to produce more coherent results (Kohen-Vacs et al., 2024). Furthermore, another important area where AI's contribution is significant and can greatly enhance the quality of the educational process is improving accessibility (Lowenthal et al., 2024).

Nevertheless, the influence of AI goes beyond technical progress. As highlighted in articles in Open Praxis (Bozkurt et al., 2024) and EURODL (L'Enfant, 2024), the use of AI results in significant pedagogical changes:

(1) It blurs the line between human and mechanical guidance.

(2) It reshapes the concept of evaluation, shifting the emphasis from qualitative human judgement to automated processes.

(3) It introduces new power dynamics into the learning relationship, where the machine becomes an active participant in the cognitive process.

At the same time, serious concerns are mounting about how dependence on AI tools might reduce the authenticity of academic work and hinder the development of higher cognitive skills such as critical thinking and creative synthesis (Durak et al., 2024). In this context, worries about academic integrity, the accuracy of information, reliability, and security provided by AI are growing, calling for scrutiny from expert and experienced scientists (Karatas & Yüce, 2024; Ullmann et al., 2024). Other challenges include:

(1) Security and cost of deep learning applications in open learning environments for big data sets (Estrada-Molina et al., 2024).

(2) Appropriate pedagogical framework especially in distance education where dropout rates are often high (Göçmez & Okur, 2023).

(3) The ethical use of AI underscores the increasing need for training in ethics and bias management within teacher education programmes, where the responsible and ethical use of applications such as ChatGPT for lifelong learning is a vital issue (Estrada-Molina et al., 2024; Karatas & Yüce, 2024; Ullmann et al., 2024).

However, it is noted that without crucial guidance, there is a risk that students' exposure to AI tools may result in a superficial understanding of knowledge, undermining the deeper process of meaning-making in the learning experience. In many cases, rather than using AI to extend their thinking, students tend to mechanically delegate cognitive processes to it, risking the passivation of the learning process. Duan and Zhao (2024) found that while AI applications

enhance the autonomy and professional development of distance education teachers, they also increase digital burnout, mainly due to the pressure to continuously adapt to new technological demands.

At the level of organisational and institutional challenges, universities now need to review their core structures: data management policies, privacy protections, and the integrity of academic assessments. As Kohen-Vacs et al. (2024) emphasise, there is an urgent requirement to develop strategies for the ethical management of AI in education, both in policy and everyday practice. Furthermore, the importance of training teachers in higher education and beyond is highlighted, as students or pupils often excel as users, particularly in the humanities (Ullmann et al., 2024). A modern challenge for design professionals, the concern that AI tools may replace human jobs, is a human resource issue and organisational growth opportunity through training programmes (Yang, 2024).

2 Methodology

2.1 Aim and Research Questions

The existing literature clearly demonstrates a growing academic interest in the application of AI in higher education. This is corroborated by the substantial body of research that has emerged in the relatively short period since the advent of Generative AI technologies. However, there remains a need for more evidence-based insights into how and why higher education students, especially those in distance learning environments such as open universities, engage with these tools. Additionally, a significant gap exists in research concerning the use of AI technologies at the Hellenic Open University (HOU) in Greece. This gap emphasises the importance and relevance of the current cross-sectional study, which aims to explore students' perspectives and practices related to AI tools like Chatgpt. Specifically, the study seeks to address key issues including students' perceived benefits of AI for learning, the barriers and challenges they face, and the steps necessary to ensure the effective and ethical integration of AI technologies in education. This research intends to examine the opportunities, challenges, and limitations associated with AI, while also considering the ethical implications inherent in the use of Generative AI tools, along with the risks of potential misuse and exploitation. Using an exploratory research approach based on quantitative methods, data were collected through surveys conducted over two consecutive academic years (2023-24, 2024-25). The findings offer valuable insights into the present and future roles of AI in distance education institutions, highlighting potential advancements and avenues for development. Comparing data from both years allows us to understand how this phenomenon is evolving. Furthermore, this study aims to make a meaningful contribution to the ongoing discourse on the digital and ethical dilemmas arising from educational transformation through AI technologies. This study is organised around the following research questions:

***RQ.1**: What is the perceived level of AI tools usage among HOU students?*
***RQ.2**: What are the perceived benefits of AI tools for HOU students?*
***RQ.3**: What do HOU students perceive as the challenges of using AI tools?*
***RQ.4**: What is the perceived framework among HOU students for the proper use of AI tools?*

2.2 Research Tool

For this study, a survey research method was chosen as suitable for identifying current trends and collecting empirical data at a specific point in time. This approach enables the examination of existing conditions within the subject under investigation (Robson, 2010). Survey designs involve gathering data to assess the current attitudes, beliefs, opinions, or practices of a relevant sample population (Creswell, 2012). In line with this approach, an online questionnaire was developed to collect quantitative data through closed-ended questions. The primary aim was to explore the perceptions and practices of postgraduate students at the Hellenic Open University regarding AI tools. The questionnaire was created through multiple drafts and discussions among the research team, supported by insights from the literature on related studies examining HE student perceptions and experiences (Aldossary et al., 2024; Ali et al., 2023; Balabdaoui et al., 2024; Barrett & Pack, 2023; Capinding & Dumayas, 2024; Chan & Hu, 2023; Hajam & Gahir, 2024; Karataş & Yüce, 2024; Serhan & Welcome, 2024; Sevnarayan, 2024). To ensure the content validity of the instrument, a specialist in distance education and an AIED expert conducted a thorough review, focusing on the relevance and clarity of the questionnaire items before distribution. A pilot study was subsequently carried out with 15 students, and revisions were made to reduce ambiguity, eliminate redundancies, and improve wording clarity. The

final version of the questionnaire consisted of 12 items aligned with the research questions and utilised a 5-point Likert scale to gather responses (Table 1).

Table 1 Survey Details

Research questions	Questionnaire items
Demographics	Age, Gender, Year of Study, Perceived Level of Digital Skills *[1: Very Low to 5: Very Good]*
RQ.1: What is the perceived level of AI tools usage among HOU students?	1. To what extent are you familiar with the concept of AI? *[1: Very Low to 5: Very Good]* 2. To what extent are you familiar with the use of AI? *[1: Very Low to 5: Very Good]* 3. To date, have you used AI applications in your work? *[Yes/No]* 4. To date, have you used AI applications in the context of your distance learning? *[Yes/No]* 5. For what reason(s) have you not used an AI application to date? 6. How likely do you consider using an AI tool in the immediate future in the context of your distance learning (in the next 1-2 months)? *[1: Not at all to 5: Very much]* 7. To what extent do you use AI applications for: *[1: Not at all to 5: Very much]* *-Finding/shaping ideas for tasks* *-Solving problems* *-Correcting, editing and improving written content* *-Translating written text* *-Information search/research* *-Supporting coding (programming)* *-As personal tutor* *-Essay writing*
RQ.2: What are the perceived benefits of AI tools for HOU students?	8. To what extent do you agree with the following benefits of using AI applications? *[1: Totally disagree to 5: Totally agree]* *-Improvement of performance in written assignments and exams* *-Improvement of study and understanding of course material* *-Improvement of search and research* *-Help and feedback* *-Freeing up time*
RQ.3: What do HOU students perceive as the challenges of using AI tools?	9. To what extent do you agree with the following, as difficulties/obstacles to the use of AI applications? *[1: Totally disagree to 5: Totally agree]* *-Little familiarity with question creation (prompting)* *-Insufficient knowledge and skills in using AI tools* *-Insufficient training in using AI tools* *-Cost of using AI tools and limited access* *-Insufficient support from the EAP in the use of AI tools* *-Low level of awareness of the EAP on the issue of AI in education* *-Unclear ethical and moral framework for the use of AI tools* *-Undefined copyright in the produced content* 10. To what extent do you agree with the following, as problems from using AI applications? *[1: Totally disagree to 5: Totally agree]* *-Dependence of technology companies* *-Low degree of human control over content* *-Low reliability and validity of the content produced* *-Reduced ability to search, control information and think critically* *-Reduced cognitive abilities of students* *-Increased plagiarism* *-Downgrading the role of the teacher* *-Increased digital divide in higher education*
RQ.4: What is the perceived framework among HOU students for the proper use of AI tools?	11. To what extent do you agree with the following as necessary actions for the proper use of AI applications? *[1: Totally disagree to 5: Totally agree]* *-Strengthening public dialogue* *-Informing students and teachers* *-Regulatory framework for use, regulations, legislation* *-Amendment/change in curricula* *-Free access to AI tools for the university community* *-Technical support from the Hellenic Academy of Sciences* *-Enhancing research and innovation in the field of AI in education* *-Ensuring data privacy and security in educational applications of artificial intelligence* *-Training on ethics and morals of AI* *-Training in technical knowledge of AI tools* *-Training teachers on educational use of AI -Amendment/change in distance learning materials* *-Amendment/change in distance written assignments/activities* *-Amendment/change in distance learning exams* 12. To what extent do you agree that familiarization/training in AI applications in distance education: *[1: Totally disagree to 5: Totally agree]* *-is just as important and necessary as in F2F education* *-is necessary for all scientific fields* *-is of no particular importance* *-is important mainly in the humanities and social sciences* *-is important mainly in the sciences* *-contributes to the quality of studies* *-has many risks and problems*

2.3 Sample, Data Collection and Analysis

The survey was conducted using an online questionnaire in Greek through Google Forms. The internal consistency of each dimension measured in the questionnaire was assessed with Cronbach's alpha coefficient, a widely recognised reliability indicator. The analysis showed strong internal consistency across all dimensions, in line with benchmarks outlined by Tavakol and Dennick (2011). Specifically, Cronbach's alpha values ranged from 0.760 for items related to perceived benefits to 0.920 for items assessing the perceived necessary actions to ensure the proper utilisation of AI technologies. These results indicate that the items used to evaluate students' usage patterns and perceptions were reliable and suitable for further statistical analysis. Quantitative surveys employing questionnaires often require random sampling methods to obtain a representative basis for identifying and describing opinions, attitudes, and beliefs, as highlighted by Cohen et al. (2011). However, implementing a random sampling approach can be challenging due to practical issues related to time and resource constraints. Therefore, this study employed convenience sampling, as recommended by Creswell (2012), where respondents were selected based on their availability and willingness to participate. The target demographic included students enrolled in the postgraduate programmes "Education and Technologies in Distance Teaching and Learning Systems" and "Educational Sciences" at the Hellenic Open University, with participation being entirely voluntary and responses collected anonymously. Due to the geographical dispersion of participants, the online questionnaire was distributed via email and social media invitations. Ultimately, the convenience sample comprised 373 student respondents who completed the questionnaire. Responses were collected during two periods: the academic years 2023-24 (101 respondents) and 2024-25 (272 respondents). Statistical analysis was conducted using SPSS version 27, applying both descriptive and inferential methods to gain comprehensive insights from the data. During data analysis, no data cleaning was required, as responses were complete, consistent and free from obvious discrepancies or outliers. To examine a) potential group differences, the non-parametric Mann–Whitney U test and Kruskal–Wallis test were employed, and b) associations, the non-parametric Spearman's rank order test was used, as non-parametric methods are recommended for analysing individual Likert scale items (Clason & Dormody, 1994; Harpe, 2015). Concerning the sample (Table 2), in Y1 most participants were women (81.2%), aged between 41-45 years (25.7%), in their first year of study (50.5%), with a perceived ICT skills level at a medium level (M =3 .66, SD = 0.828). In Y2, most participants were women (84.6%), aged between 26-30 years (19.1%), in their second year of study (54%), and perceived ICT skills at a medium level (M = 3.74, SD = 0.795).

Table 2 Sample Demographics

Demographics	Frequencies	
	Y1: 2023-24	Y2: 2024-25
Sex	Male: 19 (18.8%) Female: 82 (81.2%)	Male: 42 (15.4%) Female: 230 (84.6%)
Age	18-25: 3 (53%) 26-30: 11 (10.9%) 31-35: 15 (14.9%) 36-40: 21 (20.8%) 41-45: 26 (25.7%) 46-50: 12 (11.9%) 51-55: 10 (9.9%) 56-60: 3 (3%) 61-65: 0 (0%)	18-25: 14 (5.1%) 26-30: 52 (19.1%) 31-35: 44 (16.2%) 36-40: 44 (16.2%) 41-45: 44 (16.2%) 46-50: 34 (17.6%) 51-55: 24 (12.5%) 56-60: 9 (8.8%) 61-65: 3 (3.3%)
Year of studies	1: 51 (50.5%) 2: 40 (39.6%) 3: 8 (7.9%) 4: 2 (2%)	1: 85 (31.3%) 2: 147 (54%) 3: 25 (9.2%) 4: 15 (5.5%)
Perceived Level of Digital Skills	M = 3.66 SD = 0.828	M = 3.74 SD = 0.795

3 Results

3.1 HOU students experience and familiarity with AI

The first research question investigates HOU students' perceived level of AI tools usage. As shown in Table 3, although they are moderately familiar with the concept of AI, they lack

familiarity with its actual use, with no differences between the two academic years. This is reflected in the following two questions (Table 4), where 52.5% of respondents in the academic year 2023-24 and 52.9% in 2024-25 have never used AI tools in their work. Similarly, 57.4% and 53.3% have never used AI during their distance studies.

Table 3 Familiarity with AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 101)	Y2: 2024-25 (n = 272)
	Median/Mode (IQR)	Median/Mode (IQR)
1. To what extent are you familiar with the concept of AI	3/4 (3-4)	3/3 (2-4)
2. To what extent are you familiar with the use of AI	3/3 (2-3)	3/3 (2-3)

Table 4 Use of AI

Items	Medians and Interquartile Ranges (IQRs)			
	Y1: 2023-24 (n = 101)		Y2: 2024-25 (n = 272)	
	Median/Mode (IQR)		Median/Mode (IQR)	
3. To date, have you used AI applications in your work	53 (52.5%)	48 (47.5%)	144 (52.9%)	128 (47.1%)
4. To date, have you used AI applications in the context of your distance learning	58 (57.4%)	43 (42.6%)	145 (53.3%)	127 (46.7%)

The Mann–Whitney U test and Kruskal–Wallis test found no significant differences between academic years and demographics regarding familiarity with the concept and use of AI.

Spearman's rank-order correlation was conducted to assess relationships between the following items:

(1) "Perceived Level of Digital Skills" and "1. To what extent are you familiar with the concept of AI" for academic year 2023-24. There was a statistically significant, moderate positive correlation with $rs(99) = 0.470$, $p < 0.001$.

(2) "Perceived Level of Digital Skills" and "2. To what extent are you familiar with the use of AI" for academic year 2023-24. There was a statistically significant, moderate positive correlation with $rs(99) = 0.403$, $p < 0.001$.

(3) "Perceived Level of Digital Skills" and "1. To what extent are you familiar with the concept of AI" for academic year 2024-25. There was a statistically significant, moderate positive correlation with $rs(270) = 0.445$, $p < 0.001$.

(4) "Perceived Level of Digital Skills" and "2. To what extent are you familiar with the use of AI" for academic year 2024-25. There was a statistically significant, moderate positive correlation with $rs(270) = 0.403$, $p < 0.001$.

Twenty-eight (28) of the participants (48.28%) who answered "No" to question "*4. To date, have you used AI applications in the context of your distance learning?*" stated that it was not necessary (Table 5).

Table 5 Reasons for not using AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 58*)	Y2: 2024-25 (n = 145*)
5. For what reason(s) have you not used an AI application to date		
- Not needed	**28** (48.28%)	**90** (62.07%)
- I do not know	9 (15.52%)	17 (11.7%)
- All the above	10 (17.24%)	33 (22.8%)
- Other reasons	11 (18.97%)	5 (3.4%)

Note: * Only those who answered 'No' in Item 4

Furthermore, based on their response to question "*6. How likely do you consider using an AI tool in the immediate future in the context of your distance learning (in the next 1-2 months)?*" their answers were somewhat low (Table 6).

Participants who answered "Yes" to question "4. To date, have you used AI applications in the context of your distance learning?" indicated that they utilise AI for various tasks (Table 7). During the academic year 2023-24, the most common tasks were "Information search/research" and "Finding/shaping ideas for tasks," whereas in the academic year 2024-25, the most common tasks were "Information search/research" and "Translating written text."

Table 6 Intention to use AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 58*)	Y2: 2024-25 (n = 145*)
	Median/Mode (IQR)	Median/Mode (IQR)
6. How likely do you consider using an AI tool in the immediate future in the context of your distance learning (in the next 1-2 months)	2/2 (1-3)	2/1 (1-3)

Note: * Only those who answered 'No' in Item 4

Table 7 Actual use of AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 43)	Y2: 2024-25 (n = 127)
	Median/Mode (IQR)	Median/Mode (IQR)
7. To what extent do you use AI applications for:		
-Finding/shaping ideas for tasks	3/4 (2-4)	3/4 (2-4)
-Solving problems	3/2 (2-4)	3/3 (2-4)
-Correcting, editing and improving written content	2/2 (1-3)	2/1 (1-3)
-Translating written text	3/4 (1-4)	4/4 (2-4)
-Information search/research	3.5/4 (2-4)	3/3 (2-4)
-Supporting coding (programming)	1/1 (1-2)	1/1 (1-2)
-As personal tutor	2/1 (1-3.75)	2/1 (1-2)
-Essay writing	1/1 (1-2.75)	1/1 (1-2)

3.2 HOU students perceived benefits of AI

The second research question explores perceptions of AI's benefits. As shown in Table 8, throughout both academic years, students believe AI enhances their search and research skills. Additionally, support, feedback, and time-saving are also important advantages. The Mann–Whitney U test and Kruskal–Wallis test found no significant differences between academic years and demographics regarding the benefits of AI.

Table 8 Benefits of AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 101)	Y2: 2024-25 (n = 272)
	Median/Mode (IQR)	Median/Mode (IQR)
8. To what extent do you agree with the following benefits of using AI applications		
-Improvement of performance in written assignments and exams	3/4 (2-4)	3/4 (2-4)
-Improvement of study and understanding of the course material	4/4 (3-4)	4/4 (3-4)
-Improvement of search and research	4/4 (4-4)	4/4 (3-4)
-Help and feedback	4/4 (3-4)	4/4 (3-4)
-Freeing up time	4/4 (3-4)	4/4 (3-4)

3.3 HOU students perceived challenges of AI

The third research question explores students' perceptions of AI's benefits. As shown in Table 9, throughout both academic years, students identify insufficient training as the most significant challenge of using AI, due to a lack of knowledge and skills in operating AI tools, while ethical and copyright issues are also considered important by the students.

Furthermore, regarding perceived problems, students in the academic year 2023-24 highlighted dependence on AI companies and the limited human control over content as the most critical issues, whereas students in the academic year 2024-25 pointed out decreased abilities to search, control information, and think critically, along with increased plagiarism (Table 10).

3.4 HOU students perceived necessary actions for the use of AI

The fourth research question investigates students' perceptions of the necessary actions for the proper use of AI applications and training. As shown in Table 11, students from the academic year 2023-24 believe that training teachers on the educational use of AI is the most essential action, alongside training on technical knowledge and ethics related to AI. Meanwhile, for the academic year 2024-25, training on ethics was reported as the most essential action.

Furthermore, regarding familiarisation/training in AI (Table 12), students in both the academic years 2023-24 and 2024-25 agree that it is necessary for all scientific fields, contributes to the quality of distance studies, but has many risks and problems.

Table 9 Challenges of AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 101)	Y2: 2024-25 (n = 272)
	Median/Mode (IQR)	Median/Mode (IQR)
9. To what extent do you agree with the following, as difficulties/ obstacles to the use of AI applications		
-Little familiarity with question creation (prompting)	4/4 (3-4)	4/4 (3-4)
-Insufficient knowledge and skills in using AI tools	4/4 (4-4)	4/4 (4-4)
-Insufficient training in using AI tools	4/4 (4-4)	4/4 (4-4)
-Cost of using AI tools and limited access	3/4 (2-4)	3/4 (4-4)
-Insufficient support from the EAP in the use of AI tools	3/4 (3-4)	4/4 (3-4)
-Low level of awareness of the EAP on the issue of AI in education	3/3 (3-4)	3/3 (3-4)
-Unclear ethical and moral framework for the use of AI tools	4/4 (3-4)	4/4 (3-4)
-Undefined copyright in the produced content	4/4 (3-4)	4/4 (3-4)

Table 10 Problems of AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 101)	Y2: 2024-25 (n = 272)
	Median/Mode (IQR)	Median/Mode (IQR)
10. To what extent do you agree with the following, as problems from using AI applications		
-Dependence of technology companies	4/4 (3-4)	4/4 (3-4)
-Low degree of human control over content	4/4 (2-4)	4/4 (3-4)
-Low reliability and validity of the content produced	4/4 (3-4)	4/4 (3-4)
-Reduced ability to search, control information and think critically	4/4 (2-5)	4/4 (3-5)
-Reduced cognitive abilities of students	4/4 (2-4)	4/4 (3-5)
-Increased plagiarism	4/4 (2-4)	4/4 (3-5)
-Downgrading the role of the teacher	2/2 (2-4)	3/2 (3-4)
-Increased digital divide in higher education	3/4 (2-4)	3/4 (3-4)

Table 11 Necessary actions for the proper use of AI applications

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 101)	Y2: 2024-25 (n = 272)
	Median/Mode (IQR)	Median/Mode (IQR)
11. To what extent do you agree with the following as necessary actions for the proper use of AI applications		
-Strengthening public dialogue	4/4 (4-4)	4/4 (4-4)
-Informing students and teachers	4/4 (4-5)	4/4 (4-5)
-Regulatory framework for use, regulations, legislation	4/4 (4-5)	4/4 (4-5)
-Amendment/change in curricula	4/4 (3-4)	4/4 (3-4)
-Free access to AI tools for the university community	4/4 (4-5)	4/4 (4-5)
-Technical support from the Hellenic Academy of Sciences	4/4 (4-5)	4/4 (4-5)
-Enhancing research and innovation in the field of AI in education	4/4 (4-5)	4/4 (4-5)
-Ensuring data privacy and security in educational applications of AI	4/4 (4-5)	4/4 (4-5)
-Training on ethics and morals of AI	4/4 (4-5)	4/4 (4-5)
-Training in technical knowledge of AI tools	4/4 (4-5)	4/4 (4-5)
-Training teachers on educational use of AI	4/4 (4-5)	4/4 (4-5)
-Amendment/change in distance learning materials	4/4 (3-4)	4/4 (3-4)
-Amendment/change in distance written assignments/activities	4/4 (3-4)	4/4 (3-4)
-Amendment/change in distance learning exams	3/3 (3-4)	3/3 (3-4)

4 Discussion

A comparative analysis of data from the two academic years shows a generally stable trend in students' perceptions and practices regarding AI, with only minor changes observed. In both years, more than half of students had not used AI tools in their studies, and familiarity with

Table 12 Familiarization/Training in AI

Items	Medians and Interquartile Ranges (IQRs)	
	Y1: 2023-24 (n = 101)	Y2: 2024-25 (n = 272)
	Median/Mode (IQR)	Median/Mode (IQR)
To what extent do you agree that familiarization/training in AI applications in distance education		
-is just as important and necessary as in F2F education	4/4 (2-4)	4/4 (2-4)
-is necessary for all scientific fields	4/4 (4-4)	4/4 (3-4)
-is of no particular importance	2/2 (2-2)	2/2 (2-3)
-is important mainly in the humanities and social sciences	2/2 (2-2)	2/2 (2-3)
-is important mainly in the sciences	2/2 (2-2)	3/2 (2-3)
-contributes to the quality of studies	4/4 (3-4)	4/4 (3-4)
-has many risks and problems	4/4 (3-4)	4/4 (3-4)

AI remained moderate, indicating limited practical engagement. However, there was a slight increase in the range of AI use cases in 2024–25, particularly for translation tasks and research support, suggesting a gradual but growing diversification of AI applications among students.

Perceived benefits such as improved research and time-saving remained steady over the years. However, ethical concerns became more prominent in 2024–25, as shown by increased agreement with statements about reduced critical thinking, higher rates of plagiarism, and low content validity. The demand for institutional support and structured training stayed high in both groups, although the 2024–25 cohort placed more importance on ethical guidance and curriculum reform. These findings indicate a cautious shift in awareness and expectations, while also revealing ongoing systemic gaps in training, policy, and pedagogical adaptation that need to be addressed to better support AI integration.

Below, we critically analyse the study's findings, organised around the four research questions. It combines student data with international literature to provide a deeper understanding of how AI is currently perceived, utilised, and managed in HOU.

RQ.1: What is the perceived level of AI tools usage among HOU students?

The findings reveal a gap between understanding and practical application of AI tools. Although students reported moderate familiarity with AI, more than half of the participants in both academic years had not used AI in their coursework or remote learning. This suggests a superficial engagement with AI, as noted in Aldawsari and Almohish (2024), who observed passive awareness without practical use. Among those who had used AI, their applications were mostly limited to basic academic tasks, such as searching for information, translating, and generating ideas, demonstrating a utilitarian rather than a strategic or transformative approach. These behaviours reflect the global trend of early-stage AI adoption in education, where students view AI as a productivity aid rather than a partner for critical thinking (Bozkurt et al., 2024). Furthermore, students with higher self-reported digital skills were significantly more likely to be familiar with AI, aligning with research indicating that digital self-efficacy predicts technological adoption (He, 2024). This highlights that digital literacy remains a crucial factor for AI integration and should be a primary focus for institutional efforts.

RQ.2: What are the perceived benefits of AI tools for HOU students?

Students generally recognised the practical value of AI tools, especially in improving research efficiency, supporting academic tasks, and saving time. These perceived benefits remained steady across both academic years, indicating a consistent but somewhat limited appreciation of the practical advantages AI can offer. The most highly rated benefit across both groups was enhancing search and research skills, followed by AI's usefulness in providing feedback and making study processes more efficient. These findings align with those of Chan and Hu (2023), who emphasise that AI's immediacy and responsiveness boost students' sense of control and academic confidence, particularly in asynchronous settings. However, lower ratings in areas such as exam and assignment performance suggest that students may still be cautious about trusting AI for high-stakes tasks. This reluctance could stem from concerns over accuracy, originality, and ethical boundaries (Barrett & Pack, 2023), highlighting the uncertain level of trust students place in generative AI tools.

RQ.3: What do HOU students perceive as the challenges of using AI tools?

The study identified key barriers to effective AI adoption, mainly inadequate training, limited skills, and lack of institutional support. These issues were consistent across different academic

years and reveal systemic flaws in preparing students for AI-driven learning environments. Students highlighted ethical ambiguity, low content validity, and an increased risk of plagiarism as primary concerns, aligning with Durak et al. (2024), who warn that unchecked AI use may threaten academic integrity and diminish critical thinking skills. The perception of a reduced ability to search, evaluate, and think critically further supports arguments by Ullmann et al. (2024), who caution against "cognitive outsourcing" when AI replaces rather than enhances human judgment. Additionally, students expressed concerns about growing dependence on AI platforms owned by private companies, reflecting a rising awareness of data governance and techno-political issues. As Kohen-Vacs et al. (2024) observe, without clear regulatory frameworks, the line between educational innovation and exploitation can easily become blurred.

RQ.4: What is the perceived framework among HOU students for the proper use of AI tools?

Despite challenges, students showed strong support for structured, ethical, and institutionalised AI integration. The most highly rated actions included training for teachers, ethical education, and regulatory policies, demonstrating that students do not oppose AI but advocate for responsible implementation. This aligns with global academic calls for "AI competence frameworks" (Filo et al., 2024) and echoes Bozkurt et al. (2024) manifesto supporting proactive governance, ethical safeguards, and curriculum redesign. The study also reveals students' belief that AI training should be interdisciplinary. This is a crucial insight emphasising the universal importance of AI literacy in modern education. Students supported reforms not only in teaching and learning materials but also in assessment design, recognising that traditional models may struggle under the pressures of generative AI. As Gesser-Edelsburg et al. (2024) argue, pedagogical adaptation must go hand in hand with technological change to preserve academic integrity.

The findings above show that digital skills affect how perceived AI usefulness influences adoption. The study expands theories on constructivist distance education, demonstrating that AI shifts epistemology from memorisation to creation. It highlights tensions between AI efficiency and integrity, positioning AI as a pedagogical disruptor rooted in critical pedagogy, data ethics, and digital humanities. A lack of training remains a significant obstacle: institutions like HOU should prioritise workshops, literacy, and practical training. Respondents call for reforms in curriculum, learning, and assessment, redesigning tasks to reduce misuse and promote critical thinking. Teacher training should include scenario-based and ethics-focused programmes for AI integration. Students support ethical policies on AI, plagiarism, data privacy, and integrity. Bridging the digital divide through free AI access and support is crucial for fairness.

Despite these contributions, some limitations remain. Convenience sampling restricts the ability to generalise findings beyond the studied groups. Self-reported data may introduce biases such as social desirability or inaccurate self-assessment. The absence of qualitative methods limits the understanding of students' attitudes, motivations, and ethics. Additionally, the cross-sectional design, comparing only two academic years, does not track individual changes over time. Future research should consider longitudinal studies, mixed methods, more disciplines, faculty perspectives, actual AI skills, and targeted interventions like ethics training or AI literacy workshops to better explore responsible AI in distance education. Cross-institutional and international studies could also uncover cultural and structural factors influencing AI adoption and ethics.

Implications for theory: Our study supports the idea that the success of technology in distance education depends not only on the tool (in this case, artificial intelligence), but mainly on how prepared the students, teachers and the institution itself are. This implies that theories of distance education must consider critical digital literacy and the ethical implications of technology.

Implications for practice: The findings show that the answer is not to ban artificial intelligence, but to manage it properly. The university needs to develop specific policies and guidelines to integrate artificial intelligence creatively into its curricula, providing systematic and dynamic training and education for both students and faculty.

Limitations: Because the research was conducted on postgraduate students of a specific programme at the Hellenic Open University's School of Humanities, the results may not apply to other postgraduate programmes, either within the same or other schools, undergraduate students, or other universities. Additionally, the data is based on the students' self-reports, so there may be some deviation from their actual usage.

Future research could explore the real impact of artificial intelligence on student performance.

A survey of teachers' opinions would also be valuable, with the results then compared with those from other universities.

5 Conclusions

This study provides valuable empirical insights into how postgraduate students at the Hellenic Open University engage with AI in distance learning. Although students show a moderate conceptual understanding of AI, their practical application remains limited, mainly due to a perceived lack of necessity, low digital readiness, and insufficient institutional support.

Although those who use AI report tangible benefits such as improved research efficiency, writing assistance, and time management, significant challenges persist. Concerns include ethical uncertainties, reduced human oversight, potential erosion of critical thinking, and threats to academic integrity. Students also pointed out structural issues, including unclear guidelines, limited access to training, and a lack of support from university authorities. To tackle these problems, respondents called for comprehensive institutional measures: legislative frameworks, ethical training for educators, curriculum reform, and improved technical support. Importantly, students emphasised that AI education should be cross-disciplinary and equity-oriented, reflecting its wide-ranging impact on academic life.

Overall, while students are cautiously optimistic about AI's role in education, their acceptance depends on responsible, transparent, and research-based integration. Ensuring that AI enhances rather than diminishes the quality of learning will require ongoing collaboration among educators, policymakers, and technologists.

Conflicts of interest

The authors declare that they have no conflict of interest.

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