

Research Article

Perceptions of generative AI in education: Insights from undergraduate and master's-level future teachers

Maria Tsiani¹, Ioannis Lefkos² and Nikolaos Fachantidis³

¹Laboratory of Informatics and Robotics in Education and Society, University of Macedonia, Thessaloniki, Greece (ORCID: [0009-0008-0502-8199](https://orcid.org/0009-0008-0502-8199))

²Laboratory of Informatics and Robotics in Education and Society, University of Macedonia, Thessaloniki, Greece (ORCID: [0000-0002-1895-4588](https://orcid.org/0000-0002-1895-4588))

³Laboratory of Informatics and Robotics in Education and Society, University of Macedonia, Thessaloniki, Greece (ORCID: [0000-0002-8838-8091](https://orcid.org/0000-0002-8838-8091))

As AI continues to transform educational practices, understanding its potential benefits, limitations, and ethical implications is critical. This study explores future educators' perceptions of generative AI in higher education. Through a mixed-methods approach, this research gathered insights from undergraduate and master's level students on their familiarity with, willingness to use, and concerns about AI-driven educational tools. Findings highlight a general positivity toward AI's utility in learning and teaching, with key advantages including personalised feedback, time efficiency, and academic support. Conversely, challenges related to reliability, academic integrity, and the potential for over-reliance reveal areas for further guidance and digital literacy enhancement. Post-intervention data suggests that hands-on experience with AI can reduce concerns and foster a balanced perspective on AI adoption in education. This study underscores the need for ethical frameworks and policy guidance to support the responsible integration of AI in educational contexts.

Keywords: AI in higher education; ChatGPT; Digital literacy; Generative AI; Student perceptions; Teacher education

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1. Introduction

The rapid progress of artificial intelligence in building intelligent systems that achieve environmental perception, action and prediction is flooding the world with a series of much-discussed technological innovations, pervasive in all aspects of our lives. As artificial intelligence wins the popularity race among modern cutting-edge technologies, an emerging approach within it is beginning to experience a spectacular boom. This is the so-called Generative Artificial Intelligence, which is a subset of Artificial Intelligence [AI] that focuses on creating new and original content by training it on large datasets. The example of ChatGPT, released in late 2022, seems to mark a turning point in the history of artificial intelligence as it attracted billions of users in just a couple of days.

This rapid progress in AI could not leave education unaffected. Many AI tools are already widely used in higher education and have a practical impact on the complex academic world

Address of Corresponding Author

Ioannis Lefkos, PhD, Laboratory Teaching Staff, 156 Egnatia Street, GR-546 36 Thessaloniki, Greece.

✉ lefkos@uom.edu.gr

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(Crompton & Burke, 2023). Recently, researchers have started to study the targeted use of GPT in education by developing applications that can benefit both teachers (e.g., by designing programmes and creating educational materials and activities) and students (e.g., by providing support and feedback) (Miao & Holmes, 2023).

Of course, like any other innovation, it is escorted by challenges and concerns regarding the educational use of ChatGPT and AI in general, academic integrity, ethics, confidentiality, and several other aspects highlighted in the literature.

1.1. Benefits and Challenges of Generative AI

Generative models such as ChatGPT are already being used in various functions of university institutions, including learning, teaching, research, administration, and community engagement (Sabzalieva & Valentini, 2023). These tools can provide personalised learning experiences by creating instructional or assessment materials tailored to the needs of individual students, acting as virtual teachers (Dwivedi et al., 2023). They can also provide students with personalised feedback and customised scaffolding in real time, facilitating constructivist learning (Dai et al., 2023).

Nevertheless, generative AI technologies carry certain risks that need careful consideration. It has been claimed that ChatGPT sometimes presents biased results revealing discrimination against underrepresented groups (Kasneci et al., 2023). Additionally, it has often been found to be hallucinating, i.e., providing incorrect responses (Walczak & Cellary, 2023), this way limiting their potential for use in academic and research activities. From a broader perspective, one more point for discussion concerning the advancement of these AI tools is the fear of possible replacement of people in many professions, such as teachers (Felten et al., 2023).

1.2. Students' perceptions on Generative AI

Previous studies have found that most students consider ChatGPT an innovative and friendly learning resource, have a positive attitude, and are willing to use it in the future, replacing traditional search engines (Elkhodr et al., 2023). Lozano and Blanco Fontao (2023) studied students' perceptions - from the perspective of both students and future teachers - revealing that they envision the potential use of ChatGPT to improve the learning and teaching process, thanks to its potential for a variety of applications for students and teachers. Additionally, the perceived value and cost are found to be essential factors in adopting generative AI, with students recognising the potential benefits of using ChatGPT in learning and achieving optimal results (Chan & Hu, 2023).

In Bonsu and Baffour-Koduah's (2023) study, although no significant relationship was found between students' perceptions and intentions to use ChatGPT, participants expressed an intention to utilize and adopt it in their education due to their promising experiences. And in Ngo's (2023) research, it was revealed that students had a positive attitude towards the application of the tool in education and reported benefits such as saving time, offering information in various areas, providing personalized feedback and teaching, as well as the enlightenment of ideas in writing. The difficulty of checking the reliability of sources, the production of false or inaccurate reports, and the inability to substitute words and judicious use of idioms were cited as key obstacles.

Chan and Zhou (2023) focused on the factors of knowledge, perceived value and perceived cost, highlighting their significant influence on students' intention to use generative artificial intelligence in higher education. Chan's (2025) investigation of students' perceptions of the concepts of generative artificial intelligence and plagiarism revealed a complex landscape of understanding, with students disapproving of the full use and copying of ChatGPT's output in assignments and seeing this act as academic - very dishonest. However, they are ambivalent about the nuanced uses of artificial intelligence.

More recently, a research by Chan and Tsi (2024) examined the potential of generative AI to transform teaching and learning within higher education, particularly regarding whether AI can or should replace human educators. This study highlights that while a subset of participants views

generative AI as capable of replicating certain teaching functions, the majority emphasise qualities intrinsic to human teachers—such as critical thinking, emotional understanding, and social competencies—as irreplaceable assets in education. In order to effectively navigate the integration of generative artificial intelligence while preserving the essential human components of education, the authors propose that educators and educational institutions should focus on AI literacy, confront ethical and privacy issues, and utilise the strengths of artificial intelligence in a manner that complements the role of human instructors.

Despite the growing interest in the use of genetic AI technologies in education, the review of the above studies demonstrates limited exploration of their application and perceived benefits and challenges in higher education settings. Much of the existing research revolves around overly optimistic or pessimistic views of genetic AI tools, such as ChatGPT, leaving a significant gap in understanding students' attitudes towards their integration into universities. The new digital world opened up by the AI revolution raises fundamental questions about the future of education and seems uncertain and disorienting to many people, especially students, who are at the beginning of their professional careers. These critical issues will be examined in this study with the aim of contributing to the ongoing debate around the latest developments in genetic artificial intelligence, strengthening its theoretical background and practical foundation in the context of higher education. Our mixed-methods study aims to bridge a gap in our understanding regarding the role of generative AI in education by focusing specifically on future educators' perceptions. Not much is known about how future educators perceive and whether they are willing to engage with these technologies. Targeting this population, this study contributes vital insights for shaping policies, curricula, and professional development strategies that support responsible, ethical, and effective use of AI in education.

In the first part of the study, we investigate the views of undergraduate and master's students – future teachers – regarding the educational dimensions of generative AI and highlight possible differences stemming from their demographics, like gender, age or prior experience with this technology. In the second part, we examine how a targeted, small-scale hands-on intervention may influence future teachers' openness to integrating AI into teaching practices.

This study aims to evaluate the perceptions of students / future teachers on the use of ChatGPT in teaching and learning, as well as the ways of its application in higher education. For this purpose, the following research hypotheses are examined:

RH1: Students are familiar with generative artificial intelligence technologies such as ChatGPT.

RH2: Students have positive perceptions towards the use of generative artificial intelligence technologies, such as ChatGPT, in their learning, research and future careers.

RH3: Students are concerned about the use of generative artificial intelligence in higher education.

RH4: Students understand the benefits and challenges of using artificial intelligence technologies, such as ChatGPT, in teaching and learning.

RH5: There are differences in frequency of use, understanding, willingness to use, benefits, and challenges between undergraduate and master's students regarding generative artificial intelligence and the integration of ChatGPT into education.

RH6: Master's students show an improved understanding of generative artificial intelligence technologies and more positive attitudes towards the integration of ChatGPT in higher education after completing the intervention.

2. Methodology

2.1. Research Design

This is a mixed-method research that incorporates both quantitative and qualitative data to address the research questions. Quantitative analysis provided an overview of trends and correlations between subscales, while qualitative analysis added depth by revealing the underlying reasons behind students' attitudes.

2.2. Participants

The target population defined for the research is undergraduate and postgraduate students of a Greek University and, in particular, in a teacher education department. In terms of demographics, more than 80% of the participants were female, while the majority of participants were less than 23 years old. Almost all of them were first-year students. Over 85% were undergraduate students, most of whom were not enrolled in STEM fields. Regarding their previous experience, more than 70% stated that they had no or very scarce experience in using generative AI tools. The demographics are presented in Table 1.

Table 1

Demographic information

	n	%
Sex		
Male	28	12.1 %
Female	203	87.9 %
Age		
Less than 23	158	68.4 %
23 to 42	48	20.8 %
43 and over	25	10.8 %
Academic level		
Undergraduate	198	85.7 %
Postgraduate	33	14.3 %
Major		
STEM	26	11.3 %
Non-STEM	205	88.7 %
Have you ever used generative AI technologies like ChatGPT;		
Never	66	28.6 %
Rarely	71	30.7 %
Sometimes	63	27.3 %
Often	30	13.0 %
Always	1	0.4 %

2.3. Data Collection

The collection of data was conducted through the distribution of an online questionnaire. Respondents were selected using the convenience sampling method and voluntary participation. Data from participants' responses were collected from December 2023 to February 2024. A total of 231 replies were retrieved.

All participants gave their informed consent before taking part in the study. Moreover, the study was approved by the Committee for Research Ethics of the University.

The questionnaire was developed by Chan and Hu (2023) and consists of 26 closed-ended questions using a five-point scale and three open-ended questions to gather additional information. The questions cover topics such as previous knowledge, understanding and familiarity with ChatGPT, intention to use, perceived potential benefits and challenges, and the perceived impact of the tool on learning and teaching. This was the first part of the study considered as a pre-test.

2.4. Data Analysis

The analysis of the survey data was conducted using the statistical analysis program Jamovi (2.3.28 solid). Descriptive analysis was used to analyse the survey data, while thematic analysis was used to examine the responses to the open-ended survey questions.

Subsequently, the second part of the study followed as a post-test, which was based on the pre-test data. Thus, a didactic intervention was carried out with master's students, which had a

theoretical and laboratory character, in which different ways of implementing ChatGPT in higher education were proposed. The didactic intervention aims to introduce master's students to the topic of generative artificial intelligence and to present them with some suggestions for the effective use and application of this innovative tool in their academic careers. By offering a guided learning experience, students have the opportunity to observe the generative AI system in action and learn experientially about its multiple applications, reaping maximum learning benefits. Activities related to the use of ChatGPT for writing texts, supporting research, preparing for exams, guiding learning, etc., were designed and implemented. After the intervention, the same questionnaire was administered as a post-questionnaire.

2.5. Reliability and Validity Testing and Correlation Analysis

To investigate the reliability of the research tool, Cronbach's α coefficient was calculated. The Cronbach index values for the six items of the knowledge variable, the 8 items of the willingness variable and the four items of the concerns variable are, respectively, 0.736, 0.871 and 0.742. Since Cronbach's α values were all greater than 0.7, it is indicated that the questionnaire has acceptable reliability and that there is acceptable internal consistency between the scales (see Table 2).

Table 2

Reliability test results – Cronbach's α

<i>Scales</i>	<i>Cronbach's α</i>
Students' Knowledge of Generative Artificial Intelligence technologies	0.736
Students' Willingness to use Generative Artificial Intelligence technologies	0.871
Students' Concerns about Generative Artificial Intelligence technologies	0.742

The assessment of the validity of the conceptual construct was carried out by applying the Exploratory Factor Analysis method to investigate the correlations between the questions (variables). As can be seen in Table 3, a total of 3 different factors emerged. It is found that the first factor includes all questions of the dimension "Willingness to use generative artificial intelligence technologies" with loadings ranging from 0.506 to 0.794. Similarly, the second factor is loaded by all propositions of the dimension "Concerns about generative artificial intelligence technologies" with loadings ranging from 0.4788 to 0.7812. Finally, all variables of the Knowledge of Generative AI Technologies dimension load on the third and final factor, with values ranging from 0.42980 to 0.72244 (see Table 3). Therefore, internally, the variables considered as a concept behave as a group and constitute a common factor, which they load with higher values, which indicates the validity of the research tool.

3. Findings

The data were examined using quantitative and qualitative statistical analysis. First, a detailed presentation of the descriptive measures for all variables related to the demographic characteristics of the students who participated in the survey is provided. Next, descriptive analyses are presented for the set of variables that constituted the main part of the survey that concerned students' perceptions of the use of generative AI technologies such as ChatGPT in university education. The second stage of the analysis involved thematic analysis of the data from the open-ended questions, which addressed the benefits and challenges of using generative AI technologies.

Table 3
Results of Exploratory Factor Analysis

	Factor		
	1	2	3
K1	-0.084	-0.054	0.56
K2	-0.020	-0.016	0.646
K3	-0.037	-0.039	0.722
K4	-0.004	0.069	0.527
K5	0.155	0.149	0.460
K6	0.106	0.346	0.430
W1	0.506	-0.267	0.106
W2	0.566	-0.208	0.128
W3	0.691	-0.128	0.021
W4	0.697	0.059	0.018
W5	0.659	-0.025	-0.096
W6	0.755	0.147	-0.062
W7	0.794	0.020	0.009
W8	0.656	-0.016	-0.040
C1	-0.041	0.614	0.053
C2	-0.010	0.707	0.021
C3	-0.053	0.781	-0.024
C4	0.122	0.479	0.024

3.1. Quantitative Analysis Results

3.1.1. Students' knowledge of generative artificial intelligence technologies

As shown in Table 4, participants generally had a relatively good understanding of generative artificial intelligence, with a total mean score of $M = 3.66$ ($SD = 0.92$). In particular, the highest mean score was for the statement "I understand that Generative Artificial Intelligence have limited emotional intelligence and empathy, which may result in output that is insensitive or inappropriate" ($M = 4.02$, $SD = 0.98$). Participants reported the lowest mean score on the item "I understand that Generative Artificial Intelligence may introduce bias and bias in their production" ($M = 3.17$, $SD = 1.08$) suggesting that although they are generally aware of the limitations of generative technologies of artificial intelligence, may not be completely aware of the possible risks posed by the ability to produce biases and bias results.

Table 4
Total Mean and SD for all Scales

Scales	Mean	SD
Students' Knowledge of Generative Artificial Intelligence technologies	3.66	0.92
Students' Willingness to use Generative Artificial Intelligence technologies	3.84	0.89
Students' Concerns about Generative Artificial Intelligence technologies	3.23	1.14

For the analysis of the scales in terms of demographic data, the independent samples *t*-test was used to examine the existence of a statistically significant difference between the mean value of the two populations. The results of the *t*-test revealed the existence of a statistically significant difference in the mean score of undergraduates ($M = 2.14$, $SD = 0.98$) and master's students ($M = 2.97$, $SD = 1.05$) regarding frequency of use. The non-normal distribution of values led to the application of the Mann-Whitney U test, resulting in $U = 1858$, $p < .001$. This means that master's students use generative artificial intelligence technologies like ChatGPT more often, compared to undergraduates who rarely engage with such tools (see Table 5).

Table 5

Mann-Whitney's non-parametric test of Frequency, Willingness and Concerns for academic level, major and sex

Independent Samples t-Test

		Statistic	p
Frequency	Mann-Whitney U	1858	< .001
Note. $H_a \mu$ Undergraduate $\neq \mu$ Postgraduate			
		Statistic	p
Frequency	Mann-Whitney U	1858	.009
Note. $H_a \mu$ STEM $\neq \mu$ Non-STEM			
		Statistic	p
Willingness	Mann-Whitney U	2031	.014
Note. $H_a \mu$ Male $\neq \mu$ Female			
		Statistic	p
Willingness	Mann-Whitney U	1937	.023
Note. $H_a \mu$ STEM $\neq \mu$ Non-STEM			
		Statistic	p
Concerns	Mann-Whitney U	1734	< .001
Note. $H_a \mu$ Undergraduate $\neq \mu$ Postgraduate			

In addition, a statistically significant difference was found in the responses of students of different specialities regarding the frequency of use of generative artificial intelligence. In particular, the Mann-Whitney U test was used to analyse the values due to the non-normality of the distribution. Conducting this test showed that $U=1858$, $p = .009 < .05$, which means that the mean of STEM students' responses ($M = 2.77$, $SD = 1.03$) is statistically significantly different from the mean of students with no STEM major ($M = 2.20$, $SD = 1.01$) (Table 5).

Finally, significantly different responses regarding the frequency of use were found between age groups. The non-parametric One-Way Anova Kruskal-Wallis method (Table 6) resulted in $\chi^2(2) = 34.0$, $p < .001$. This indicates that there is a statistically significant difference in the mean response scores given by the age group of 23 to 42 years ($M = 3.02$, $SD = 0.838$), the group that is younger than 23 years ($M = 2.04$, $SD = 0.94$) and the 43 and over group ($M = 2.20$, $SD = 1.23$).

Table 6

Kruskal-Wallis' non-parametric test of Frequency and Willingness, for age groups

	χ^2	df	p
Frequency	34.0	2	< .001
Willingness	6.84	2	.033

3.1.2. Students' willingness to use generative artificial intelligence technologies

Overall, the mean score for the scale of willingness to use generative artificial intelligence technologies was $M = 3.84$ ($SD = 8.89$) (Table 4), indicating that students generally hold positive attitudes toward using generative artificial intelligence technologies such as ChatGPT and demonstrate strong agreement regarding their willingness to use these technologies in higher education settings, with mean scores in scale items ranging from 3.51 to 4.18. The values of the standard deviation show a consistency in the students' responses.

The results of the independent samples *t*-test analysis revealed a significant difference between the mean score of men ($M = 4.04$, $SD = 0.67$) and women ($M = 3.81$, $SD = 0.64$). The non-parametric test Mann-Whitney U (Table 5) had as a result $U = 2031$, $p = .014 < .05$, indicating that answers given by the two sexes regarding willingness to use AI differ statistically significantly.

Carrying out the same analysis method showed the existence of a statistically significant difference ($U = 1937$, $p = .023 < .05$) between the average score of students with a STEM major ($M = 4.06$, $SD = 0.81$) and students who did not specialise in STEM ($M = 3.81$, $SD = 0.62$) (Table 5)

The existence of statistically significant differences in terms of the way the different age groups answer the scale is considered interesting. The use of the non-parametric One-Way Anova Kruskal-Wallis test due to the lack of normal distribution ($\chi^2(2) = 6.84, p = .033 < .05$) reveals that there are differences in the average score of each age group (Table 6). Specifically, participants who belong to the age group of 43 years and older appear more willing towards the use of generative artificial intelligence systems ($M = 4.09, SD = 0.56$) compared to students who are 23 to 42 years old ($M = 3.89, SD = 0.79$) and with those younger than 23 years ($M = 3.78, SD = 0.60$).

3.1.3. Students' concerns about generative artificial intelligence technologies

In contrast to the positive views reported on the willingness to use generative artificial intelligence technologies, the statistics show that students showed less favour and expressed more neutral views on the concerns related to these types of technologies. The overall mean of responses for concerns related to artificial intelligence systems was $M = 3.23$, and the $SD = 1.14$ (Table 4). Based on the standard deviation values, a larger dispersion of the answers given by the respondents is observed. The high degree of variability in student responses possibly reflects the subjectivity of the issue, with different levels of concern.

The t -test results showed a dividing line in the answers given by the students of the two levels of study. Since a normal distribution is not followed, the Mann-Whitney U test was applied (Table 5), where $U = 1734, p < .001$, indicating that there is a statistically significant difference in the mean score of the responses of undergraduates ($M = 3.33, SD = 0.837$) and master's students ($M = 2.62, SD = 0.72$).

Furthermore, different responses to the Concerns scale were found between the different age groups. Specifically, one-way analysis of variance (one-way ANOVA) was followed by Levene's test, where the result equals $F(2,228) = 10.1, p < .001$. This reveals that the means of the under-23 age group ($M = 3.38, SD = 0.81$), the 23 to 42 age group ($M = 3.01, SD = 0.82$), and the 43 and over group ($M = 2.67, SD = 0.91$) are statistically significantly different. This result is presented in Table 7.

Table 7

One-Way Anova Fisher's test of Concerns for age groups

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Concerns	10.1	2	228	< .001

3.1.4. Results of the correlation analysis

Table 8 presents the results of the correlation analysis, which suggests a small but statistically significant positive correlation between knowledge and concerns ($r = 0.182^{**}, p < .01$), indicating that as knowledge increases, the concerns tend to increase slightly. The correlation coefficient between perceived willingness to use and frequency of use is $r = 0.217^{***}$, and there is a slight but statistically significant correlation at a significance level of $p < .001$. So, as the frequency of use increases, the willingness to use increases slightly. In addition, negative correlations were found between willingness and concerns ($r = -0.233^{***}, p < .001$), as well as between frequency of use and concerns ($r = -0.191^{**}, p < .01$), which are small but statistically significant. This shows that as willingness and frequency of use increase, concerns tend to decrease slightly. It is noted that, as the correlation analysis showed, knowledge is not statistically significantly correlated with either willingness or with frequency of use. So, willingness to use is not affected by knowledge and vice versa, and knowledge is not affected by frequency of use and vice versa.

Table 8
Correlations of scales with Spearman's correlation coefficient

	Knowledge	Willingness to use	Concerns	Frequency of use
Knowledge	—			
Willingness to use	0.039	—		
Concerns	0.182 **	-0.233 ***	—	
Frequency of use	0.097	0.217 ***	-0.191 **	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

3.1.5. Results of linear regression analysis with mediating variables

Linear regression with mediating variables is a statistical technique that analyses how the effect of an independent variable (X) on a dependent variable (Y) may occur indirectly through a third variable (M), which acts as a mediator.

Mediation occurs when the variable M transfers part or all of the effect of X on Y. Instead of X directly influencing Y, its effect is conveyed indirectly through M, allowing for a deeper understanding of the mechanisms underlying the relationships between variables (Figure 1). In the present analysis, a mediation trend was observed (indirect effect $p = .051$), suggesting concern may act as a mediator through which knowledge influences willingness to use. This suggests that the effect of knowledge on willingness is not solely direct but is also shaped through concern, revealing a more complex dynamic among the variables (see Table 9).

Figure 1

Conceptual diagram of mediation

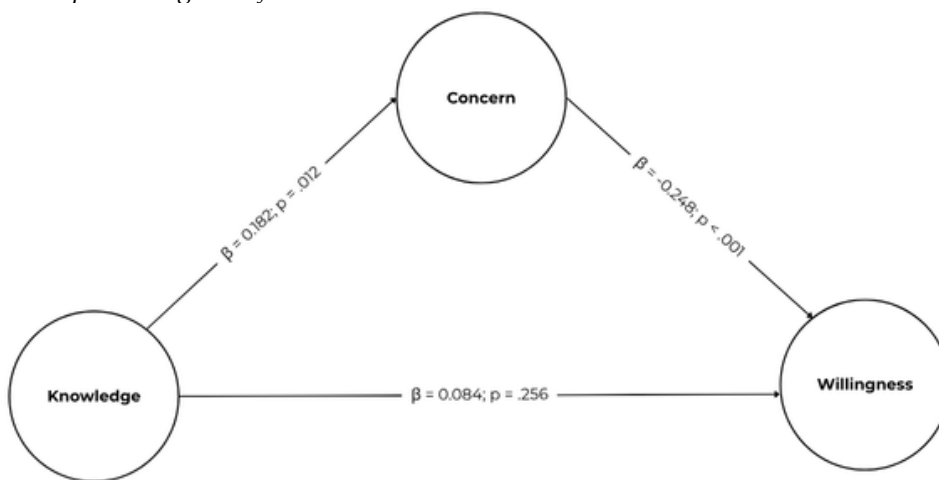


Table 9
Linear Regression analysis with mediating variables

Type and effect	Estimate	SE	95% C.I.		p
			β	z	
Indirect					
Knowledge → Concern → Willingness	-0.048	0.02	-0.045	-1.955	.051
Component					
Knowledge → Concern	0.258	0.10	0.182	2.509	.012
Concern → Willingness	-0.186	0.05	-0.248	-3.645	< .001
Direct					
Knowledge → Willingness	0.089	0.08	0.084	1.136	.256
Total					
Knowledge → Willingness	0.041	0.07	0.039	0.589	.556

Note. Confidence intervals computed with method: Bootstrap percentiles; Betas are completely standardized effect sizes.

3.1.6. Structural equation modelling [SEM] results

The Structural Equation Modelling framework is used to analyse complex relationships between variables, allowing for the examination of causal relationships between both latent and observed variables. Within this methodology, the significance of the relationships between variables is assessed based on the p -value.

The analysis using the Structural Equation Modelling framework revealed specific relationships between the variables. Specifically, knowledge appears to have a direct impact on concern, which, in turn, influences willingness to use. Additionally, knowledge directly affects willingness to use, indicating a direct relationship between these two variables.

Furthermore, an indirect relationship (mediation) was identified, as knowledge may influence willingness to use through concern. This suggests that concern acts as a mediating factor in the relationship between knowledge and willingness to use, enhancing the understanding of how these variables interact with each other. The results are presented in Table 10.

Table 10

Structural Equation Modelling results

95% Confidence Intervals					
<i>Dependent Variables</i>	<i>Predictors</i>	<i>Estimate</i>	β	z	p
Concern	Knowledge	0.258	0.182	2.81	.005
Willingness	Concern	-0.186	-0.248	-3.82	< .001
Willingness	Knowledge	0.089	0.084	1.29	.196

The results of both analyses – the Structural Equation Modelling and the Linear Regression with Mediating Variables – converge on the same conclusion: concern emerges as the mediating mechanism through which knowledge influences willingness to use. The consistency of these findings strengthens the theoretical assumption of an indirect relationship between knowledge and willingness to use, highlighting the critical role of concern as an intermediary factor in the formation of behavioural intentions.

3.2. Qualitative Analysis Results

3.2.1. Reasons for students' willingness to use Generative Artificial Intelligence

The diverse qualitative data enrich the findings from the quantitative data gathered through the three open-ended questions. These questions aimed to elicit students' perspectives on the benefits and challenges of generative artificial intelligence that fuelled their willingness and concerns about using these technologies.

As the findings from the qualitative data revealed, students consider generative AI and ChatGPT as valuable tools in their academic careers. They are willing to use these technologies primarily for convenience, learning, writing, and research purposes. Reasons stated for the willingness to use ChatGPT are as follows (by decreased frequency of appearance):

Immediate support for learning / on-demand 24/7 access. The most frequently reported reason for willingness to use generative artificial intelligence is direct learning support. This category accounts for approximately 50% of all responses. Students choose to use ChatGPT because of the quick and immediate support it can offer them in the learning process. The ability of the AI agent to provide immediate feedback, quick results, and flexibility was particularly appreciated by students. One student considers ChatGPT to be "an advanced form of educational assistance that answers questions, provides immediate information, and saves time," while another considers it "a tool that does not require much time and is useful to a considerable extent." Students often face difficult assignments and feel pressure and anxiety about how to manage their time and meet the requirements. In such cases, ChatGPT can serve as a useful tool that facilitates faster completion of assignments and tasks, helping students gain valuable time.

Ease of use, free access and efficiency. This category accounts for approximately 40% of all responses. According to the students, generative artificial intelligence systems such as Chatgpt stand out for their ease of use and effectiveness in educational contexts. For example, one student described Chatgpt as "an easy, free, accessible source of information without much effort," while another argued that it is "the easiest, most accessible, and modern way" to facilitate issues related to education. Specifically, students appreciate the tool for easily finding information, resolving queries, answering complex questions, and facilitating knowledge, learning, and education. As one student pointed out, ChatGPT makes it possible to "access information easily and quickly and seek help when a fellow student cannot provide it." In addition, students are eager to use such systems because of the comfort and security they inspire. Some students noted that "the great possibilities offered by this new technology yield a more complete result" and "quick, better, and reliable results are produced while reducing the time and effort required."

Brainstorming and reporting aid. The supporting role of genetic artificial intelligence technologies in academic writing has attracted the attention of students. Improving writing and brainstorming was frequently mentioned, accounting for approximately 30% of the total responses of participants. Some students reported that "in no time at all, they come into contact with a wealth of information that they can use in their papers, even in the context of their exams," and that "they learn useful information, improving their knowledge and skills in certain scientific fields and broadening their horizons." ChatGPT can offer technical support during the writing of assignments "by creating a work plan" and "by enriching the written text to produce a complete and well-written assignment." In addition, some participants suggested using artificial intelligence "as a tool to inspire and foster creativity among students," inspiring and motivating them to develop new ideas or creatively expand existing ones, which, as one participant pointed out, "can help students in their careers and development both in education and in life."

Research and analysis assistant. Research support was considered important but was less frequently cited as a reason for students' willingness to use genetic artificial intelligence, accounting for approximately 20% of all responses. Chatgpt can be a valuable support resource in the academic research process by offering new research opportunities. AI's ability to find, collect, and synthesise large amounts of data and knowledge can greatly facilitate research while saving time and effort. Some students suggested that the use of artificial intelligence ensures "the discovery of quick, detailed, and accurate information," "the formulation of research plans," and "the provision of optimal solutions and research ideas." In addition, it can be used to create extensive bibliographies, summarise, paraphrase and translate research articles, thereby promoting the research process quickly and effectively. Moreover, it is commented that in order to use the tool appropriately and obtain the most relevant results possible, close attention to the prompts is required: "When students ask for something from the AI, it makes them think about what exactly they should write to get the result they want".

Innovation. Some students argued that their willingness to use AI systems stems from their curiosity about these technologies and their desire to learn about something new. ChatGPT is regarded by participants as a "modern and innovative tool" and "a new technique, a different way they will use to do their work," while the view was expressed that "AI is a particularly interesting field with prospects." Students expect that familiarity with artificial intelligence will greatly benefit the development of their technological skills. According the students, "we are in an era dominated by technology and everyone wants to broaden their horizons, as technology is an integral part of our lives and an opportunity to come into contact with a modern and sophisticated world", or "It will bring about a change in the traditional way that students are used to". It should be noted that this category was only mentioned by the undergraduate participants (approximately 4% of all responses).

3.2.2 Reasons for students' worries about Generative Artificial Intelligence

The examination of the qualitative data revealed a wealth of worries that students have regarding the challenges of incorporating generative AI. Most students expressed significant concerns about the learning, educational, ethical and social impact that the use of generative intelligence in higher education might have. Reasons related to the concerns about using ChatGPT are as follows (by decreased frequency of appearance):

The reliability, accuracy, and transparency of the output. The accuracy and reliability of responses are a significant concern for the students, with approximately 30% of participants making this remark. Participants note the questionable validity and accuracy of the information produced, commenting that "the information it provides may be inaccurate or misleading." Students are concerned about using AI due to the uncertainty and subjectivity of the answers, the potential for misinformation from incorrect results, and the lack of up-to-date data. As one participant pointed out, "these technologies provide unconfirmed, often standardised, and vague answers." Furthermore, it was argued that "such technologies stand out for their high degree of automation", hence students "sometimes find it difficult to understand some of their functions." The complexity and intransparency of AI systems hinder understanding of the underlying flow and decision-making processes, as "it works like a black box".

Insufficient understanding of its operation and a lack of teaching at the university. The challenges associated with insufficient information and awareness among students about artificial intelligence technologies were mentioned by approximately 20% of participants. One student emphasised that "this technology is quite new and so not many people know about it yet; it has not been tested enough." This lack of knowledge extends to students, as they are provided with insufficient information about how ChatGPT works, its benefits, and the potential pitfalls of its use, resulting in them being plunged into ignorance or semi-ignorance. One participant argued that "there is a lack of awareness of the significant influence and impact that artificial intelligence has had in recent years." Limited familiarity and training in the proper application of AI prevent students from gaining the many benefits it can bring to a range of academic activities. According to one student, "There is insufficient information from universities and the state about genetic artificial intelligence technologies." Many may feel confused or afraid due to their lack of training and the limited institutional guidance they are provided with. One student confessed that "I am afraid that if I copy and paste something from ChatGPT, it can be checked by the professor in some way. I'm also worried that the info it gives might not be right or reliable. No teacher has told us how to use it yet, even though a lot of them have mentioned it in class."

Dependence or addiction leading to a decline in critical thinking skills. One of the main issues of great concern to students is the personal and intellectual development of a person (about 20% of all responses). In particular, the probable over-reliance on genetic AI technologies may significantly hinder the development and cultivation of personal skills. As one participant commented, "students using ChatGPT may not be able to cope with the demands of their future jobs and may lack technical and intellectual skills and competences". The addiction to using the tool to carry out tasks and find ready answers minimises personal effort and goal setting, leading to inactivity and laziness. It was argued that "students are given 'ready-made food' and as a result their own intelligence stops developing" and "they make unrestrained use of it to do assignments and exercises without necessarily cultivating any particular knowledge". The penetration of AI in various areas of life will reinforce the habit of automating tasks, undermining critical thinking, problem solving and the ability to think more deeply, and weakening creativity, ingenuity and initiative.

Professional future and career. The changes that the spread of genetic artificial intelligence in the workplace is expected to bring are likely to be sweeping. Around 12% of students mentioned the impact that the development of genetic AI may have on their future careers. The dire scenario of

the possible replacement of the human workforce by intelligent artefacts is of particular concern to postgraduate students, but even more so to undergraduates. One of them commented that "a serious cause for concern is the elimination of various professions and occupational sectors due to the evolution of technology, which may lead to an increase in the unemployment rate in the future." The "influence that genetic artificial intelligence may have on the labour market with the automation of many jobs" intensifies students' feelings of fear and anxiety about the possible reduction of jobs and the depreciation of the value of human beings. Thus, they are engaged in a constant struggle to upgrade their skills in line with the demands of the labour market and are in doubt about the viability of their chosen profession.

Depreciation of Higher Education Institutions and unfair use. Among the reported risks is the depreciation of the educational and learning process in academic institutions, mentioned by about 10% of the participants. One of the students noted that with the integration of AI, "the value of the university is lost and everything is now becoming automated". For example, one participant argued that with AI, "you don't learn things and it takes you away from the realm of books and 'meaningful' learning". At the same time, another commented on "undermining studies, as now almost everything can be answered instantly and without personal effort by AI". Further concerns were expressed by students about the potential for forgery and plagiarism, as there are fears of exploiting the potential offered by AI to create assignments, make exams more volatile and commit academic misconduct. Consequently, the authenticity of students' ideas is not recognised, and the process of finding information and carrying out a task is undermined. Indeed, it was considered "unfair for someone to do something alone while someone else uses genetic AI technologies". This may intensify student inequality, leading to a "change in dynamics, providing different opportunities and rewards between those who misuse these technologies and those who use them properly".

Ethics and privacy concerns. The ethical and social implications of genetic AI technologies were mentioned by 8% of participants. The use of genetic AI in the university raises concerns about privacy and personal data protection. Some participants commented that "we don't know if AI works ethically or not" and expressed "concern about security and protection from possible misuse or leakage of personal information". As much of the data is used as feedback to improve AI systems, students fear possible breaches of their personal information and public sharing of sensitive information. Finally, concerns about the loss of social values such as communication, direct contact, socialisation and teamwork among members of the educational process were identified. As one participant pointed out, 'students are concerned about using AI because of the loss of team spirit, cooperation, creativity and the lack of socialisation with fellow students'. Assigning activities to ChatGPT can significantly limit students' social interaction and teamwork, leading to isolation or depreciation of social relationships.

3.3. Comparison of Pre- and Post-intervention Student Perceptions of Generative Artificial Intelligence

After completing the teaching intervention, the participating master's students were asked to state their opinions regarding the academic use of ChatGPT by answering the same questionnaire they had completed before the intervention. The answers to the quantitative and qualitative questions further enrich the findings from the analysis of the original data and allow a comparison of the students' perceptions before and after the intervention.

3.3.1. Post-intervention quantitative data analysis

The analysis of the means and standard deviations of the responses given by the students to the scales of knowledge, willingness to use, and concerns after the intervention revealed significant differences compared to their statements before the intervention. The mean scores of the variables of each scale are presented in detail. The total mean score of the knowledge scale is 3.72, which is slightly higher than the value of 3.66 obtained before the intervention. This fact shows that after

completing the intervention, the participants generally had a better understanding of generative artificial intelligence technologies.

A significant difference was observed in the overall mean score of the willingness to use generative artificial intelligence scale after the intervention, which was 4.10, compared to the pre-intervention score of 3.84. This suggests that post-intervention students have a more positive attitude towards generative artificial intelligence technologies.

Regarding the scale of concerns, after the intervention, the overall mean value of 2.89 is lower compared to the score of 3.23 recorded before the intervention, which indicates that the students still maintain a neutral attitude towards potential challenges, but this time are placed closer to "disagree".

To examine the possibility of statistically significant differences in the way students respond to the variables before and after the intervention, the independent samples t-test was applied. Since the values did not show a normal distribution on all three scales, the non-parametric Mann-Whitney U test was used. The analysis of the knowledge scale in terms of opinions before and after the intervention resulted in $U = 1898$ and $p = .327 > .05$, which indicates that there is no statistically significant difference between the two groups regarding how they respond to the scale. Furthermore, the students' responses after the intervention do not differ significantly from the responses before the intervention in terms of the willingness to use the generative artificial intelligence scale ($U = 1650$, $p = .072 > .05$). And in the case of the worry scale, no statistically significant difference was identified between the groups ($U = 1736$, $p = .129 > .05$).

3.3.2. Post-intervention qualitative data analysis

The analysis of the qualitative data revealed the following reasons for students' willingness to use generative AI (by decreased frequency of appearance):

- Immediate support for learning / on-demand 24/7 access
- Ease of use, free access and efficiency
- Research and analysis assistant

It is quite obvious that the above broad categories are similar to the ones reported at the pre-instruction questionnaire (see section 3.2). Learning support is the main reason behind graduate students' willingness to work with genetic AI. It seems that after the intervention, students still mostly appreciate ChatGPT's ability to be readily available and provide extremely fast answers to their questions, which helps them save valuable time to engage in more important activities. As some of the participants mentioned, "it helps us save time in our search" and "it saves time and workload". Students are also motivated to use AI technologies because of the great ease of accessing, finding and gathering information. ChatGPT's ability to provide immediate assistance and information on countless topics without the need to navigate multiple websites makes it an attractive resource for postgraduate students. Another important factor that enhances the willingness to use such systems is the efficient completion of academic assignments. AI is recognised as an aid for drafting and writing papers, as students can use it to obtain the template and initial design on which to structure their paper, organise their information and integrate it organically into the paper by formulating it in an appropriate manner. Participants noted that the tool "provides an immediate answer when we need it, solves questions and is a helpful tool at all times" that allows "to find literature for our work" and "to understand and interpret foreign language sources". In addition, one student expressed that "we can get ideas for our projects that we might not have thought of", demonstrating the tool's ability to present a wide range of ideas that can trigger students' inspiration and creative thinking for further research.

Although the multiple benefits of generative artificial intelligence tools make students willing to use them in their studies, the existence of certain risks creates several concerns for them. In analogy to the findings that emerged from the students' responses before the intervention, the most significant concerns of the Master's students related to (by decreased frequency of appearance):

- The reliability, accuracy, and transparency of the output
- Depreciation of Higher Education Institutions and unfair use
- Dependence or addiction leading to a decline in critical thinking skills

Additionally, it appears that, even after the intervention, the possibility of inaccurate, plausible and incorrect responses remains a significant concern for participants. As claimed by some, technologies such as ChatGPT "lack validity and are prone to errors and fake annotations", and the fact that they "provide unfounded material, often with limitations in the Greek language", mitigates their confidence and willingness to integrate such tools into everyday practices at the university. One student pointed out that "ChatGPT cannot be used and cited as a source as is done with e.g. an article, because it does not provide accurate and reliable information. You need to have a very good knowledge of the content to be able to evaluate the information it provides". The inaccuracy of the tool is attributed to the fact that, while its knowledge is based on a wide range of sources, it does not accept updates with up-to-date information and is trained on events of a limited time span. As one student commented, "the seemingly logical and correct answers seem to make students unconcerned about the tool. However, not updating the system and not providing comprehensive information raises many concerns." For these reasons, students are concerned that AI may contribute to the dissemination of inaccurate information, leading to the undermining of knowledge and its improper or irresponsible use for academic purposes. They fear this will hinder the development of skills and risk academic misconduct.

It is worth noting that in the post-intervention questionnaire, the Master's-level participants did not report challenges for their future professional careers, did not express concerns about moral and ethical issues, as well as the lack of information, possibly due to the more detailed approach provided to them in the context of their Master's degree.

3.3.3. Overall Pre- vs. Post-intervention analysis

Following the practical AI session, the Master's students exhibited a modestly positive shift in their perceptions of generative AI. The study found that the participants' self-assessed knowledge and willingness to use AI both increased, while their level of concern about AI's challenges declined. Even though none of these changes were statistically significant, they indicate a tendency towards increased receptivity to AI tools.

From a qualitative perspective, the intervention reinforced students' appreciation of the benefits of AI, as the immediate support, ease of use, and efficiency. These benefits were identified as the primary reasons for their willingness to use generative AI. At the same time, the main concerns revealed persistent issues relating to output accuracy and reliability, the potential for academic misconduct (e.g. plagiarism), and an overreliance that could lead to reduced critical thinking skills.

It is important to note that some of the earlier concerns were subsequently dispelled. In contrast to their pre-intervention responses, the post-intervention feedback did not include concerns regarding insufficient information or training, moral/ethical dilemmas, or negative career implications. This absence suggests that the targeted session effectively addressed these issues, providing the participants with a more informed and balanced perspective, indicating that the practical experience had a positive yet moderate impact.

4. Discussion

This paper provides an analysis of the perceptions of undergraduate and Master's level university students – future teachers regarding the use of generative artificial intelligence technologies, a cutting-edge technology that is increasingly invading everyday life and education. The aim was to study (a) the understanding, willingness to use, benefits and challenges perceived by students regarding the use of generative artificial intelligence in teaching and learning, along with its applications in higher education, and (b) the effect of a targeted, hands-on intervention on the students' perceptions.

Our findings revealed a complex landscape of perceptions that includes both students' enthusiasm and concerns. According to the results, most students had no or insufficient experience in using ChatGPT. However, they stated that they are generally familiar with generative AI technologies, even though they do not use them widely. Their sense of familiarity can also be explained by the vivid conversation happening in social or mass media over the last couple of years. This result is also consistent with the findings of Chan (2025), who demonstrated the low experience of using generative artificial intelligence, but also of Singh et al. (2023), where students' familiarity with the tool was highlighted. Still, they did not use it regularly for academic purposes. In addition, the findings revealed that STEM students use generative AI more often, while non-STEM students prefer to use it less often. This can be attributed to the fact that STEM students have more expertise in such technological systems and have a different professional orientation, which makes it imperative to utilise these tools. It is also worth noting that students aged 23 to 42 make the most frequent use of ChatGPT. Moreover, the inadequacy in the use experiences of generative artificial intelligence indicates the existence of room for growth in adoption and integration.

Overall, the participants reported having a good understanding of generative artificial intelligence technologies and knowledge of their capabilities and limitations, demonstrating support for the assumption that students are aware of these technologies. This finding contrasts with the study of Lozano and Blanco Fontao (2023), who recorded a significant lack of knowledge of the future teachers about ChatGPT, which is attributed to the fact that its use is not initially pre-determined for education. Also, our study revealed that students' knowledge is slightly correlated with their concerns about using generative AI tools. This implies that the more students know about ChatGPT, the more alarmed they are. Greater awareness of artificial intelligence systems also raises more concerns among students. The finding of a correlation between knowledge and concerns contrasts with the findings of Chan and Hu (2023), who found that knowledge is significantly correlated with both willingness to use and frequency of use.

In addition, it was found that students expressed positive attitudes towards the use of these technologies in learning, teaching and research. Quantitative and qualitative data showed that participants are willing to utilise and integrate generative artificial intelligence tools into their studies and that they recognise the benefits they can bring to learning and teaching practices. Similar findings were also found in some other studies (Bonsu & Baffour-Koduah, 2023; Chan, 2025; Lozano & Blanco Fontao, 2023; Ngo, 2023). Therefore, the hypothesis that students have positive perceptions towards the use of generative artificial intelligence in their future teaching and learning practices is sufficiently supported. Also, the findings showed that students majoring in STEM fields are more willing to use generative artificial intelligence models in their studies than students without a STEM major. The willingness of STEM students may be due to the greater comfort and familiarity they have with using such tools due to their field of expertise. It is impressive that students older than 43 are more open and willing to adopt generative artificial intelligence tools in their studies and future careers than younger students. Such a difference could be attributed to the core characteristics of older students, who are mid-career professionals returning to study, or people looking to start a second career by earning a degree, having a pragmatic orientation. Interestingly, perceived willingness to use AI technologies correlates with the frequency of use, meaning that the more students engage with ChatGPT, the more willing they are to use it in the future. This probably means that AI tools most of the time did come up to their expectations, providing timely feedback to their queries, and this is in line with the findings of the study by Chan and Hu (2023). Additionally, a negative correlation was found between perceived willingness to use and concerns, suggesting that the more willing students are to use generative artificial intelligence technologies, the less they worry about them. This finding is similar to the observations of Chan and Zhou (2023). However, it is different from the results of Chan and Hu (2023).

The study found that students perceive the potential benefits of applying generative artificial intelligence to university learning and teaching. Despite the positive perceptions of the use of generative artificial intelligence technologies, the existence of particular challenges creates concerns for the participants. The students expressed reservations about issues of reliability, personal development, and ethics. However, quantitative data show that their views on concerns are characterised by neutrality and uncertainty, similar to the study by Bonsu and Baffour-Koduah (2023) and Chan (2025). The existence of ambivalent perceptions about artificial intelligence as a supportive tool for writing and learning or as a potential agent of inappropriate behaviour in the university highlights the need to provide clear guidelines for its use and the development of digital literacy (Chan, 2025; Lozano & Blanco Fontao, 2023). Therefore, the research hypothesis that the students express concerns about using generative artificial intelligence technologies is supported. In fact, younger students seem to be more aware of the challenges associated with generative artificial intelligence. In contrast, students in the older age groups remain neutral or uncertain about the potential risks. Of interest was the finding of a weak but statistically significant negative correlation between concerns and frequency of use, indicating that the more students engaged with ChatGPT, the less concerned they were about it. Concerns about the risks of using the tool decrease with practical experience, a result that aligns with the findings of Chan and Hu (2023).

Quantitative findings revealed that master's ICT students use generative AI tools more often, while undergraduates rarely choose ChatGPT as an aid to their learning. A possible explanation for this finding is that the nature of the specific master's degree promotes students' engagement with such technologies, while undergraduates are not necessarily inclined to become familiar with and utilise it within their curriculum. Additionally, master's students appear to express less concern about the potential negative impact of generative AI technologies than undergraduates, who are neutral on the concerns. Otherwise, both groups seem to be equally familiar with and understand generative AI tools while expressing positive intentions toward adopting ChatGPT in their academic and future careers. Therefore, the fifth research hypothesis is partially supported, as differences were found only in the frequency of use and perceived concerns. Similarly, Elkhodr et al. (2023) found that both undergraduate and master's ICT students understand ChatGPT as a useful and enjoyable tool and are willing to use it. However, contrary to the findings of this paper, the researchers found that master's students find it less useful, which is due to their higher level of knowledge or technical expertise, resulting in a perceived reduced need for AI-derived assistance. Nevertheless, they recognised that by using the tool, they performed significantly better on the tasks.

After the intervention, the students are more optimistic about the potential application of the tool to improve their teaching and learning practices. They had more knowledge about generative AI technologies and more positive attitudes towards adopting them in their studies and future work. They particularly appreciated the multiple applications that generative AI tools can have for both students and teachers, recognising important benefits such as immediate learning support, great ease of use, practical help in writing assignments and generating ideas. Despite the positive perceptions, they remain neutral on the potential challenges that accompany the use of AI tools in the university. Concerns reported by students focused on inaccuracy and unreliability, plagiarism, and the negative impact on personal development. On the other hand, they did not express any concerns about moral and ethical issues (as they did before the intervention). In our view, this could be an effect of our intervention, implying that a hands-on experience with AI tools can shift students' views by targeting their concerns.

Our results contribute to the literature by providing data for the mediating role of concerns in the relationship between AI knowledge and intention to use, suggesting that targeting only the knowledge is insufficient to increase the willingness to use AI tools, unless people's concerns are addressed at the same time. Both the Structural Equation Modelling analysis and the Linear Regression with mediation yielded consistent results, indicating that concern is a key intermediary

mechanism through which knowledge influences intention. The convergence of results across these two distinct analytical approaches strengthens the reliability of the model and supports the theoretical proposition that knowledge alone is not sufficient to shape intentions. Instead, its influence appears to be activated and amplified through emotional factors such as concern, which emerges as a critical element in the formation of behavioural intentions. Viewed under the lens of the Expectancy-Value Theory [EVT], where students' concerns can be interpreted as "perceived cost", these findings are consistent with the findings of Chan and Zhou (2023), who also deployed this theoretical framework in a similar study. In other words, the perceived cost originating from students' concerns mediates the perceived benefit of knowledge to their intention to use AI applications.

As revealed through this work, there are multiple reasons behind students' eagerness and concerns about generative Artificial Intelligence. On the one hand, students envision the incorporation of AI technologies in their future academic and professional careers as a step towards the increasing and inevitable technological evolution of our time. On the other hand, they express concerns about the "dark side" of the tool, which they are hesitant about. Students' reluctance towards the challenges posed by AI reflects the ongoing debate in the academic community about its proper use and can be attributed to the absence of a universal consensus on its use and the lack of "safeguards" to delimit its utilisation at the desired levels. Overall, as Chan and Hu (2023) argue, there is a need for a balanced approach to the application of generative artificial intelligence, which promotes its judicious use and understanding of its risks. Using it as a complementary tool that has added value and improves our lives can yield maximum learning results while minimising problems.

5. Conclusions

Our findings revealed that students are familiar with and aware of generative AI tools, although they do not use them widely. Overall, they have positive perceptions of AI tools and are willing to incorporate them into their future academic and professional practices, recognising its benefits to their learning, research and future careers. Nevertheless, they express ambivalent worries about issues of trustworthiness, privacy, ethics and the potential impact on their personal and professional development. These perceptions formed the context of the teaching intervention, in which students practised the multiple ways of applying AI technologies to teaching, learning, and academic research. After hands-on experience with the tool, students demonstrated an improved understanding of the benefits of generative AI in improving learning and academic performance and were more positive about adopting it for their future academic and professional pursuits. However, persistent student uncertainty about the potential risks of using AI tools makes it necessary for educators and policymakers to address concerns and promote learning.

The above conclusions enrich the existing research and illuminate the perceptions of students, who are the primary users of new technologies and future professionals in an era increasingly driven by artificial intelligence. Users determine the value and reach of new technologies, depending on how well they can manage them properly and be engaged constructively with them.

Students' perspectives, experiences and concerns as users of technologies can influence their learning approach and outcomes. Understanding students' views on the use of generative AI technologies can help educators, policymakers, and universities to effectively tailor their interventions to meet the needs of learners, improve their learning experiences and promote their positive attitudes towards technological innovation. Communicating student perceptions can pave the way for informed decision-making, the development and implementation of robust strategies, and the promotion of safe adoption of innovation in higher education. Suggestions for the AI application contribute to equipping students with supplies that do not stop at the level of basic knowledge but enhance literacy and practical use of generative AI tools at the university and beyond.

This perspective aligns with the notion that the future of education will hinge not on AI replacing educators but on a harmonious relationship that enhances both teaching and learning. Integrating this approach can serve as a foundation for future educators to understand and adapt AI tools responsibly, offering an essential framework as they prepare to enter the evolving landscape of AI-assisted education.

As AI technologies are still in their early stage of adoption worldwide, our work provides valuable insights regarding teachers' education programs and policymaking in Higher Education Institutions. Since future teachers display a willingness to use these technologies, it would be fruitful to incorporate the use of generative AI into university courses, promoting their knowledge and, at the same time, ensuring a pedagogically sound deployment. This aligns with UNESCO's recently published guidelines (Miao & Holmes, 2023; Sabzalieva & Valentini, 2023). Additionally, clear guidelines of use and ethical frameworks seem to be required to address the concerns about ethics and academic integrity. Universities worldwide are already publishing their AI usage policies, giving a good example for the rest to follow. The evidence provided by our study points towards the direction of balancing innovation with the management of risks of using AI, e.g., bias, overreliance, "AI-giarism" (Chan, 2025).

The positive shift observed after the brief intervention implemented in our study further highlights the value of integrating hands-on AI experiences into teacher education programmes. This would ensure that new teachers enter the profession with a nuanced understanding of both the benefits and challenges posed by AI.

Given the theoretical gaps in the literature that demonstrate the lack of research on the use of AI tools in academic settings, the present work is likely one of the earliest empirical studies to explore student perceptions and the application of generative AI technologies in higher education in Greece. However, the existence of certain limitations must be taken into account when interpreting the results. In particular, the use of the convenience sampling method is likely to introduce limited non-subjectivity. Conducting the research exclusively on students of our University limits the generalisation of the outcomes to the wider community of students at Greek universities. In addition, the smaller number of Master - level participants, compared to the much larger number of undergraduate students, demonstrates the lack of balance in the sample. Moreover, as the Master's degree is oriented to education, most participants were non-STEM majors, accounting for an imbalanced sample from this perspective. It is also noted that the findings were based on student self-reported data, meaning that these subjective measures are inherently vulnerable to bias. Furthermore, this study focuses exclusively on the perceptions of students, disregarding the perspectives of other members of the university, such as, for example, academics and staff. Finally, the rapidly changing nature of generative AI, which is subject to continuous development, may render the study's findings outdated.

Future research can focus on exploring student perceptions of generative AI adoption by examining larger and more diverse samples from multiple institutions nationwide so that the findings are richer and reflect student views as broadly as possible. In addition, it is emphasised that in future studies, there is a need to explore the perceptions of a wide range of stakeholders, including both educators and university staff, in order to create a comprehensive framework for understanding the perspectives and needs of users. of different competencies for generative Artificial Intelligence technologies.

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