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PAPER

Impact and Opportunities of Generative Artificial Intelligence in Education: A Study of Academic Perceptions

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ABSTRACT

This study evaluates the impact, adoption and perceptions of "Generative Artificial Intelligence" among professors in a higher education environment. The aim is to understand how these tools can enrich teaching and learning. Through a descriptive analysis of a questionnaire distributed to a sample of 71 professors focused on higher education, both the advantages and disadvantages of this technology were examined by formulating two key hypotheses: (1) the use of generative artificial intelligence (GAI) increases understanding of its benefits over potential barriers, and (2) the experience with the use of GAI increases willingness towards its integration into educational practice. The analysis, based on "R" software, supports the first hypothesis by observing that professors consistently perceive more advantages than disadvantages when using the tool. However, the second hypothesis is rejected since a decrease in the intention to use GAI over time was detected. This result suggests that, despite recognising the advantages, some professors are still not fully convinced or prepared to adopt this technology in their daily teaching activities.

KEYWORDS

artificial intelligence, higher education, Chatgpt, professors, training, teaching, generative artificial intelligence (GAI)

1 INTRODUCTION

The widespread use of generative artificial intelligence (GAI) such as chat generative pre-trained transformer (ChatGPT) by OpenAI [32] or Gemini by Google [21] has marked a turning point in education [1]. Since its launch in November 2022, ChatGPT has shown great potential to transform traditional pedagogical practices, fostering both enthusiasm and scepticism among educators. Baidoo-Anu and Owusu Ansah [4] conclude that the use of ChatGPT can promote more personalised and interactive learning.

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Additionally, GAI's ability to learn from both structured and unstructured data makes it a highly flexible and versatile conversational artificial intelligence tool [8, 39]. Its ability to adapt to user preferences and conversational styles over time makes it an effective tool for building long-term relationships with customers and users [13].

Generative artificial intelligence not only facilitates the automation of administrative tasks, easing the operational burden on professors, but also allows for the generation of personalised learning materials that can be tailored to the specific needs of individual learners [17, 23, 27]. However, this transformative potential is accompanied by significant challenges, which highlights the imperative need to adequately train professors in the effective use of these technologies [4, 15] given their impact.

In particular, ChatGPT is a conversational chatbot developed by OpenAI, an organisation composed of researchers and technologists committed to building artificial intelligence in a free, secure and responsible way [11]. Founded in 2015, OpenAI has received significant collaboration and funding from major technology companies such as Microsoft and Amazon. The development of ChatGPT builds on advances in natural language processing [9] by automatically generating answers to queries and supporting activities such as writing emails, drafting essays, creating images [41] or coding software [22].

Gimpel et al. [15] suggest that GAI tools enhance professors' capabilities by providing an improved learning experience and facilitating administrative and pedagogical tasks. Several questions therefore arise: Is this positive perception shared by the teaching profession, what are the handicaps or advantages perceived by teaching faculty when integrating these technologies into their daily practice?

In addition, this study aims to investigate the tasks in which AI is most frequently used and current adoption trends. These questions form the starting point of the research, focusing on assessing not only the potential effectiveness of AI in teaching but also its acceptance and effective use by professors in their everyday context by providing answers to the previous questions.

This study aims to analyse separately the advantages and disadvantages from a higher education professors' perspective of using GAI in the classroom, as previous studies emphasise that over-reliance on these tools could lead to a decrease in critical thinking and creativity among students or professors, attributes that are essential for success in academic and professional life [6, 32, 37].

2 LITERATURE REVIEW

2.1 Advantages of using ChatGPT in education

Literature studies on the use of ChatGPT identify numerous advantages that could improve both the efficiency and the quality of the teaching process. One of the main advantages is ChatGPT's ability to generate customised texts, ideas, and content for classroom application. This would allow professors to save time in preparing materials, generating texts that address specific topics or help develop new ideas for class discussions [2]. In addition, ChatGPT could facilitate work with texts previously written by other authors by providing summaries, formulating questions for class discussions, or adapting these texts to meet specific learning objectives [15, 27].

The possibility of using ChatGPT for the creation of syllabus proposals or the distribution of lectures is undoubtedly relevant. Professors could use artificial intelligence

(AI) to structure their lectures more efficiently, ensuring that content is distributed more coherently [5, 18].

In parallel to the above, GAI could suggest new didactic objectives that align with instructional design, allowing professors to improve the development of key competences among their students [15]. Classroom simulation and feedback could be another significant application of GAI. Professors could use ChatGPT to simulate classroom interactions, anticipate questions that students might ask during sessions, and get feedback on the effectiveness of their teaching methods [30]. This simulation capability could be especially useful in professor preparation by optimising classroom teaching time [4].

In the context of searching for sources, resources, authors, or bibliographic materials, ChatGPT can act as an effective assistant, recommending relevant and up-to-date materials and data that professors could incorporate into their curricula [29] or even into their academic output [20]. Finally, the tool also facilitates the translation of texts into other languages and their adaptation to different cultures, which is particularly useful in high-level, multicultural, or international educational environments, allowing professors to both contextually better understand information and adapt it to a wider and more diverse audience [24].

2.2 Disadvantages of using ChatGPT in education

Despite the advantages, there are also disadvantages that professors should carefully consider when using AI tools. One of the main disadvantages is the need for prior technical knowledge to use this tool effectively. Professors who are not familiar with GAI technology may encounter difficulties when trying to integrate ChatGPT into their teaching practice, which may limit its usefulness and effectiveness [29]. Moreover, the use of ChatGPT raises some ethical implications [20, 5]. Educators should be aware of the possibility of students using ChatGPT to evade their academic effort, which would undermine teaching4 and the real goal of learning [10].

A new challenge is the adaptation of ChatGPT to the professor's teaching style or content creation [16]. Even if useful educational materials are generated by outlining the chat output with instructions, these contents may not reflect the educator's pedagogical approach of the educator, leading to a disconnect between the generated content and classroom teaching [26]. In addition, technical glitches or Internet connection problems are a significant disadvantage that could disrupt the flow of teaching-related content and cause frustration for both professor and students [7]. Thus, the following hypotheses are proposed:

Hypothesis 1 (H1): As time passes, using GAI, specifically ChatGPT, increases the perception of its advantages over the disadvantages.

Hypothesis 2 (H2): As time passes, using GAI, specifically ChatGPT, increases the willingness towards its integration and use in educational practice.

3 METHOD

3.1 Research design and flow

The research began with a focus group meeting held on June 27th, 2023, at ESIC University in Spain. The session was focused on the introduction to ChatGPT and

other relevant AI tools for teaching activities in the classroom. At the end of the meeting, research data was collected. Twenty-seven Spanish university professors attended, specialised in Marketing and randomly invited as part of a faculty training program. During this initial focus group session, we followed a mixed-methods data collection approach, including both quantitative and qualitative questions. A Likert-scale questionnaire was administered at the end of the session to gather quantitative data through closed and open-ended questions, while qualitative information was also collected from notes taken by two observers during verbal interactions.

The conclusions obtained made it possible to generate a questionnaire, which was subsequently applied to 71 postgraduate professors (Q1 + Q2 = n = 71) at the end of two faculty training formal sessions, in order to collect their perceptions of the advantages, disadvantages, and their predisposition towards the use of GAI in their professional practice.

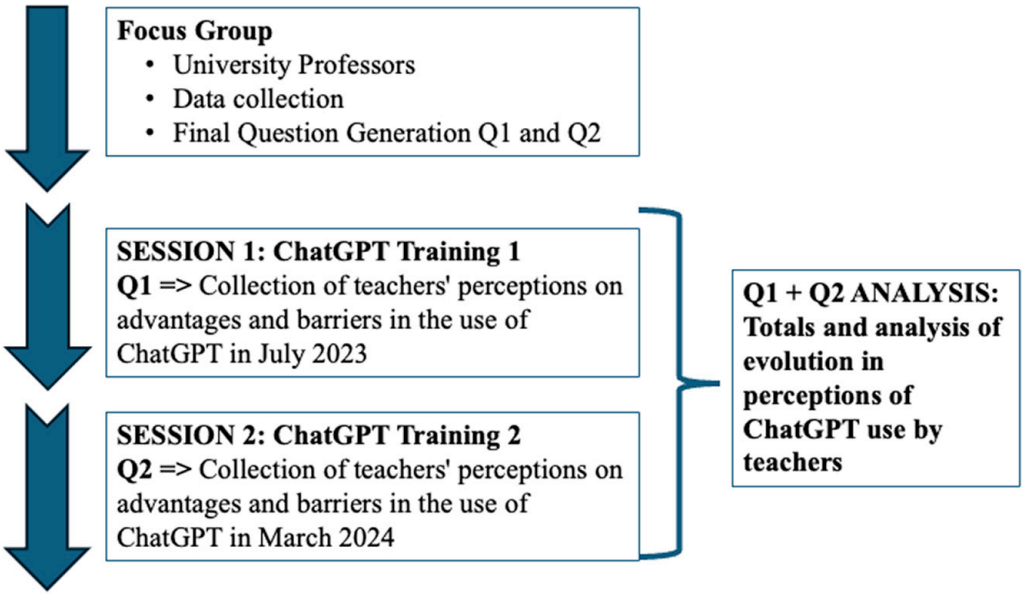


Fig. 1. Workflow in research and analysis. Own elaboration

The final Q1 and Q2 questionnaire (refer to Table 1 for the final questions), validated with a Cronbach's Alpha of 0.91, showed a high level of consistency [36]. This design made it possible not only to obtain an overview of professors' initial perceptions, but also to assess the evolution of these perceptions over time (Q1 and Q2).

3.2 Data and research sample

The data were collected through Microsoft Forms© and were subsequently subjected to a rigorous process of processing (Microsoft Excel©) and analysis using statistical software (R). Once the data had been cleaned, descriptive analyses were conducted to obtain an overview of the responses, including measures of central tendency (mean, median) and dispersion (standard deviation). These analyses allowed

us not only to validate the hypotheses but also to identify significant patterns and relationships between the variables studied, providing a solid basis for the interpretation of the results. Additionally, we performed the Mann-Whitney U test to determine whether participant perceptions (Q1 and Q2) showed a significant change.

Figure 2 shows the characteristics of the sample of professors who responded to the questionnaire on the use of ChatGPT. The responses indicate that middle-aged professors, specifically those in the 45–64 age range, were the main participants in both training sessions, with minimal representation from younger professors (18–34 years) and those aged 65 and over. In terms of the level of experience in using ChatGPT, the majority of professors in Q1 (2023) had used ChatGPT for between 11 and 40 hours, reflecting an intermediate level of familiarity with the tool at that time. However, in Q2 (2024), conducted eight months later, an increase in the number of professors with more than 80 hours of experience was observed, suggesting significant growth in confidence and use of the tool after the eight-month period.

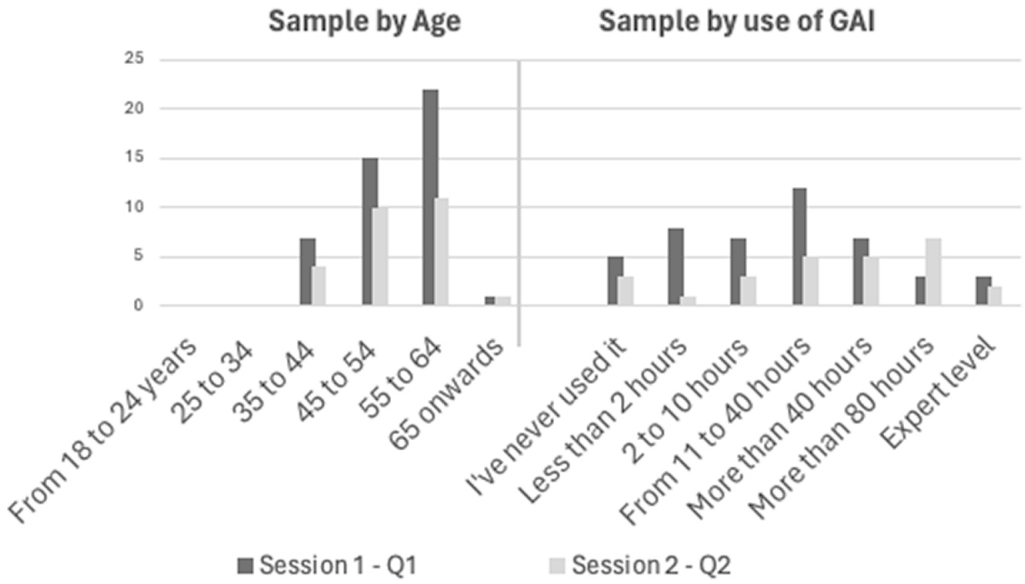


Fig. 2. Sample descriptions by age and use of ChatGPT

Source: Own elaboration.

Despite the moment in time, there are still professors who have never used ChatGPT, although this number decreased slightly in Q2, indicating a clear trend towards greater adoption. The time difference of eight months between Q1 and Q2 appears to have allowed professors to gain more experience and confidence in using ChatGPT.

4 RESULTS

In order to understand the analysis per session we split the results in P05 (advantages) and P06 (disadvantages or barriers) and finally we rank the "top 3" of the advantages and barriers according to the highest scores obtained from the arithmetic mean of each session (Q1 and Q2).

Table 1. Results of questionnaires Q1 and Q2

ID	Questions	Mean Total	Mean Q1 Jul-2023	Mean Q2 Mar-2024	Change Q1/Q2
P05_01	Generation of texts, ideas and/or content for my classes.	4.03	3.89	4.27	10%
P05_02	Work on texts written by other authors (summaries, questions, etc.).	3.86	3.69	4.15	13%
P05_03	Proposals for syllabus or class distribution	3.69	3.53	3.96	12%
P05_04	Creating examples of activities and/or cases	4.14	4.00	4.38	10%
P05_05	Proposals for learning objectives, competences and attitudes to be taught in my classroom	3.85	3.67	4.15	13%
P05_06	Generation of proposals for evaluation tests or examinations.	4.06	3.98	4.19	5%
P05_07	Simulations of my classes and students, and obtaining feedback on my classes.	3.56	3.44	3.77	9%
P05_08	Help for my powerpoints, images, slides etc.	3.94	3.89	4.04	4%
P05_09	Suggested sources, resources, authors or bibliography/PAA references	3.96	3.89	4.08	5%
P05_10	Translations of texts into other languages or adaptations to other cultures	3.87	3.64	4.27	17%
P05_11	To conduct applied research	3.37	3.29	3.50	6%
P05_12	Storytelling, copywriting, creation of prompts for other AI Apps	3.52	3.42	3.69	8%
P05_13	Study Languages	2.92	2.73	3.23	18%
P05_14	WITH STUDENTS: Encouraging critical thinking and error/improvement detection for students	3.69	3.62	3.81	5%
P05_15	Design and programming of user interfaces and/or user maps	3.17	2.98	3.50	18%
P06_01	Necessity of prior technical KNOWLEDGE to use it. Beginner's fear	2.73	2.78	2.65	–4%
P06_02	Limitations due to the need for TRAINING of ChatGPT	2.94	2.96	2.92	–1%
P06_03	FAILURES or ERRORS or inaccurate answers. Accuracy of information	3.28	3.27	3.31	1%
P06_04	Difficulty adapting to MY OWN STYLE of teaching or content creation	2.73	2.71	2.77	2%
P06_05	TECHNICAL or Internet connection failures	2.65	2.60	2.73	5%

(Continued)

Table 1. Results of questionnaires Q1 and Q2 *(Continued)*

ID	Questions	Mean Total	Mean Q1 Jul-2023	Mean Q2 Mar-2024	Change Q1/Q2
P06_06	Responsibility and ETHICS as there will always be a % of copying.	3.24	3.27	3.19	**–2%**
P06_07	Idiotizes people. Diminish our critical capacity, i.e., lead to an accommodating attitude.	2.82	2.93	2.62	**–11%**
P06_08	Students know more than professors.	2.56	2.56	2.58	**1%**
P06_09	Monthly cost/price	3.27	3.44	2.96	**–14%**
P06_10	Lack of sensitivity in handling the concept of DIVERSITY, or the GENDER perspective.	2.51	2.64	2.27	**–14%**
P08	On a general level; how easy for a professor, technically speaking, will it be to integrate ChatGPT in the classroom: Do you think professors have the right technical and operational knowledge?	6.66	6.40	7.12	**11%**
P10	How do you think ChatGPT will impact on student learning (stars from least or most negatively … to most or best/ most positively)?	7.27	6.91	7.88	**14%**
P11	After the course … in which grade will you use ChatGPT for your classes? (stars from lowest to highest)	7.85	8.02	7.54	**–6%**
	Average – % variation between Q1 and Q2				**5%**

Notes: Direct translation from the original questionnaire in Spanish. P05 and P06 are answered on a 1 to 5 scale. P08, P10 and P11 the scale is from 0 to 10.

4.1 Advantages of using ChatGPT

The ranking of the most important benefits (P05) from Q1 – July 2023 is as follows:

1. Creation of examples of activities and/or cases (mean: 4.00 out of 5.00).
2. Generation of proposals for evaluation tests or exams (mean: 3.98), which indicates ChatGPT's capacity to alleviate the workload in evaluative tasks.
3. Generation of texts, ideas and/or content for my classes, help for my power points, images, slides and proposals for sources, resources, authors, or bibliography references (mean: 3.89). ChatGPT is also perceived as a valuable support for content generation, presentation development and bibliographic search.

In the advantages (P05) of Q2 – March 2024, we can observe the most important factors:

1. Creation of examples of activities and/or cases (mean: 4.38 out of 5.00). This factor is still the main advantage in Q2.
2. Translations of texts into other languages or adaptations to other cultures (mean: 4.27). In this second session, professors highlight ChatGPT's ability to

translate and adapt texts, reflecting a more advanced use of the tool compared to the previous session.

3. Generation of texts, ideas and/or content for my classes (mean: 4.27). Content generation continues to be one of the most highly valued applications, showing an increase in score compared to Q1.

As shown by the responses, the creation of activities and cases, as well as the generation of texts, are considered the most important advantages from professors' perspective when using ChatGPT.

4.2 Barriers to use ChatGPT

GAI's cost of services factor falls 14% in perceived disadvantages between Q1 and Q2. A similar drop in importance also occurs for the concept of diversity or gender. The biggest perceived disadvantages or barriers apart from the cost, are related to the inaccuracies, failures or errors that these tools provide and the ethical responsibility associated with their use.

The most important barriers or disadvantages (P06) identified in Q1 are as follows:

1. Cost/monthly price (3.44 out of 5.00)
2. Failures or errors or inaccurate responses. Accuracy of information (3.27)
3. Responsibility and ethics, given that there will always be a % of copying (3.27).

The most important barriers (P06) in Q2 are:

1. Failures or errors or inaccurate answers. Accuracy of information (3.31)
2. Responsibility and ethics, given that there will always be a % of copying (3.19).
3. Cost/monthly price (2.96)

4.3 Future use of ChatGPT (P08, P010, P011)

An appreciable positive percentage difference (greater than the standard mean: 5% (refer to Table 1)) between Q1 and Q2 scores may indicate an increase in professor sensitivity to that study question between the two questionnaires.

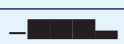
The questions "Do you think professors have the right technical and operational knowledge ..." (Q08) and "How do you think ChatGPT will impact on student learning" (Q10) show an increase in the perception of the ease of integrating ChatGPT in the classroom and its positive impact on student learning. An increase of +11% and +14% respectively, between Q1 and Q2 was observed for these questions. We can therefore state that there is an improvement in professors' perception of their technical knowledge and the impact of ChatGPT on student learning between March 2023 and July 2024.

However, question Q011, which measures the intention to use ChatGPT after the course, shows a decrease of –6% between Q1 and Q2. In other words, the sample of professors who responded to Q2 eight months later express reluctance to use ChatGPT.

4.4 Overview: advantages of using ChatGPT (Q05) versus perceived barriers (Q06)

In order to evaluate the differences obtained between advantages (P05) and barriers or handicaps (P06) in the use of GAI, we can visually observe in Table 2 a rightward displacement of the "Histogram" column in the questions oriented to analyse advantages (questions in the range: P05_*) compared to those that address disadvantages (questions in the range: P06_*).

Table 2. Descriptive analysis on advantages and disadvantages

ID	Mean	SD	p0	p25	p50	p75	p100	Histogram
P05_01	4.03	1.04	1	4	4	5	5	
P05_02	3.86	1.05	1	3.5	4	5	5	
P05_03	3.69	1.19	1	3	4	4.5	5	
P05_04	4.14	0.95	1	4	4	5	5	
P05_05	3.85	1.15	1	3	4	5	5	
P05_06	4.06	1.07	1	4	4	5	5	
P05_07	3.56	1.01	1	3	4	4	5	
P05_08	3.94	0.97	1	4	4	5	5	
P05_09	3.96	1.06	1	4	4	5	5	
P05_10	3.87	1.13	1	3	4	5	5	
P05_11	3.37	1.24	1	2	4	4	5	
P05_12	3.52	1.13	1	3	4	4	5	
P05_13	2.92	1.31	1	2	3	4	5	
P05_14	3.69	1.05	1	3	4	4	5	
P05_15	3.17	1.06	1	2	3	4	5	
P06_01	2.73	1.08	1	2	3	4	5	
P06_02	2.94	1.09	1	2	3	4	5	
P06_03	3.28	1.04	1	2	3	4	5	
P06_04	2.73	1.12	1	2	3	4	5	
P06_05	2.65	1.07	1	2	3	3	5	
P06_06	3.24	1.08	1	2	3	4	5	
P06_07	2.82	1.11	1	2	3	4	5	
P06_08	2.56	1.02	1	2	2	3	5	
P06_09	3.27	1.19	1	2	3	4	5	
P06_10	**2.51**	**1.09**	**1**	**2**	**3**	**3**	**5**	

Note: In light blue background the barriers or handicaps assessed in P06_*.
Source: Own elaboration.

This rightward shift of the P05_* histogram curve indicates that professors tend to value the benefits of ChatGPT more highly, because they perceive these benefits

in a more positive and meaningful way. The majority of responses are concentrated at the upper end of the scale (median: 50th percentile, with a strong tendency towards 4), suggesting a higher level of acceptance regarding the potential benefits of ChatGPT compared to the perceived handicaps or disadvantages.

The histograms centred on P06_* suggest that professors' perceptions of GAI barriers are more varied, as responses are more evenly distributed across the response scale, ranging from low to high scores (median: 50th percentile, with a strong tendency toward 3). This dispersion of responses reflects that not all professors perceive the same barriers with the same degree of concern. Therefore, there is greater positivity and consensus in the assessment of the advantages of using ChatGPT (P05_*) compared to the disadvantages.

4.5 Comparison of advantages and disadvantages by age and time of use of the tool

Once we cross the variables of age and time of use with the perceived advantages and disadvantages for the use of ChatGPT, the average score for the advantages is consistently higher in all cases.

Figure 3 below shows that the scores for advantages are always higher, both by age group and by time of use. The group of professors aged between 35 and 44, as well as those over 65 with more than 80 hours of use, are the ones who perceive the greatest differences between advantages and barriers in the use of ChatGPT.

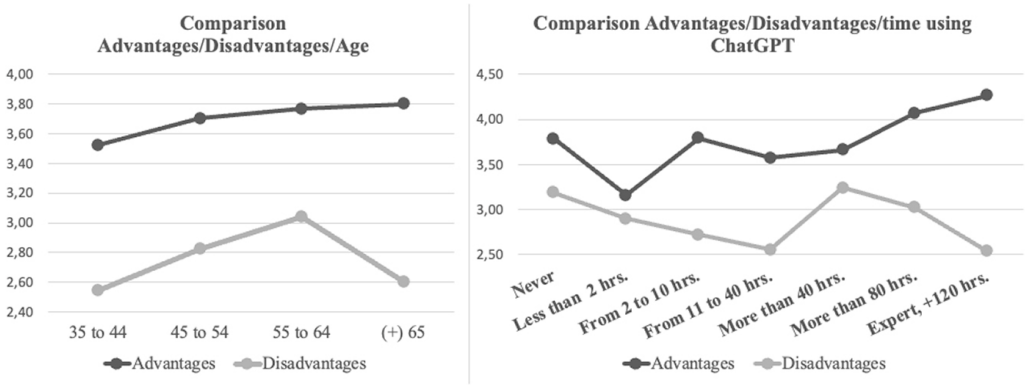


Fig. 3. Usage patterns by age and overtime

Source: Own elaboration.

As can be seen in the graphs, increases in age and duration of use correspond to a greater perceived benefit of using ChatGPT.

4.6 Evolution of scores over time: Q1 and Q2

Figure 4 shows that the largest differences in scores between Q1 and Q2, in terms of perceived advantages, are found in the following areas: studying languages (+18%), designing and programming user interfaces and/or user maps (+18%), and translating texts into other languages (+17%).

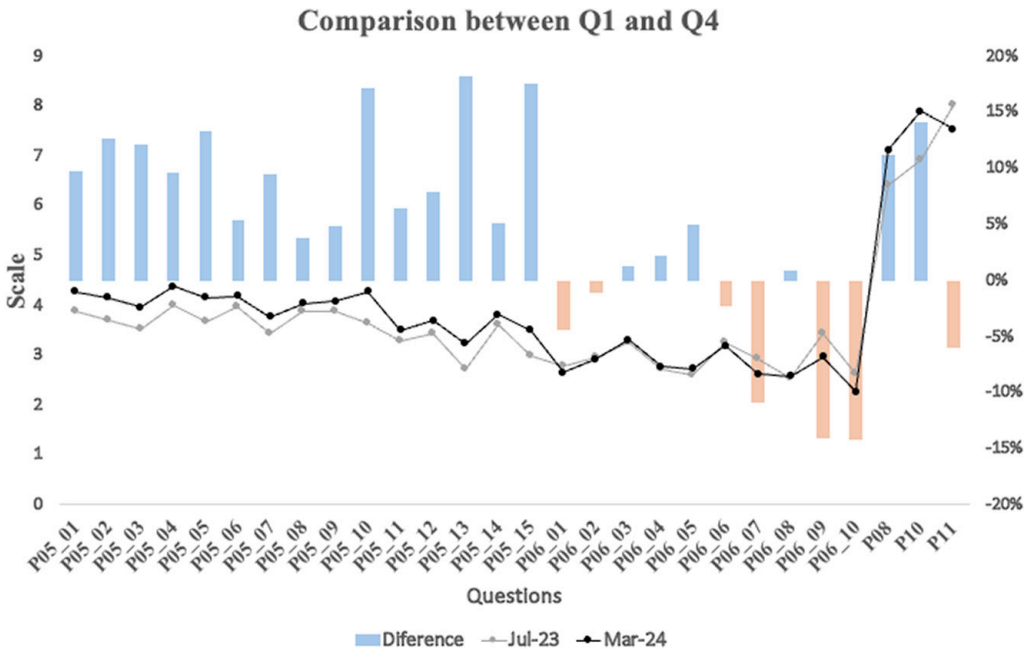


Fig. 4. Comparative graph between Q1 and Q2

Note: Questions in Table 1 own elaboration.
Source: Own elaboration.

In terms of handicaps or barriers, the largest increases in scores between Q1 and Q2 were observed in technical or internet connection failures (+5%), difficulty adapting to teaching style or content creation (+2%), and failures, errors, or inaccurate answers. As expected, these increases are significantly lower compared to those observed for the advantages.

Regarding the largest drops down in scores, which would indicate that these variables are becoming less important to professors over time, they include: the monthly cost or price (–14%), lack of sensitivity in handling the concept of diversity or gender perspective (–14%), and the perception that GAI "idiotizes" people or decreases critical thinking (–11%). A notable drop (–6%) was also observed in Q11, which measures the extent to which ChatGPT will be used in the classroom, indicating a certain degree of reluctance to further integrate GAI into professors' activities.

4.7 Statistical hypothesis test

A Mann-Whitney U test was conducted to assess whether there were significant differences in participants' perceptions by analysing Q1 and Q2.

Table 3. Mann-Whitney U-test results

Question	p-Value	Mean Q1	Mean Q2	Change
P05	.0000	3.58	3.93	**+9.9%**
P06	.0987	2.92	2.80	**–4%**
P11	.9258	8.02	7.54	**–6.0%**

Note: Own elaboration.

The results of the Mann-Whitney U test for Hypothesis 1 (H1) showed a significant difference in question Q05 (p = .0000), where the group mean in Q2 (3.93) was higher than in Q1 (3.58), with a difference of +9.9%. This result suggests that, under a 5% significance level, there is a tendency for professors to perceive more advantages in using ChatGPT as they become more familiar with the tool over time.

On the other hand, for Hypothesis 2 (H2), the results for question Q11 (p = .9258) showed no significant difference in willingness to use ChatGPT between Q1 and Q2. This indicates that, although there is an overall positive trend, there is no statistically significant change in professors' intention to use GAI, as previously observed in the descriptive analysis of Q11.

In question Q06, which assesses perceived barriers, marginally significant differences (p = .0987) were found between Q1 and Q2, suggesting that concerns about the disadvantages of using ChatGPT have diminished over time, although not strongly.

These findings indicate that, although not fully conclusive, the perceived advantages of using GAI tend to increase over time, while the perception of barriers tends to decrease.

5 DISCUSSION

Online GAI is an advanced natural language processing technology trained on large volumes of data to generate content by mimicking human communication in different contexts [33]. In this study, we examined how this technology can be effectively harnessed in higher education through a descriptive analysis conducted at two points in time. The questionnaire (Q1 and Q2) collected the perceptions of Spanish Esic business school professors and lecturers regarding the advantages, disadvantages, and predisposition towards the use of GAI [14].

The results of the study confirm that one of the most highly valued advantages among professors is the automation of tasks using ChatGPT, particularly in the preparation of visual materials, such as PowerPoint slides or images, allowing them to focus on the quality of content rather than on creating materials from scratch [5, 19]. In addition, ChatGPT easily generates test or quiz proposals, providing educators with questions on which to build their assessments [25, 30, 31].

Similarly, Villarreal and Vilalta-Perdomo [23] pointed out that the creation of activities or practical cases simulating real or fictitious situations that allow students to apply previously acquired theoretical concepts is the functionality most appreciated by professors.

Professors are also aware that ChatGPT's pre-training model can lead to glitches, errors, or "hallucinations" in its responses. Although AI is capable of processing large amounts of information, it can produce inaccurate or incorrect answers, generating erroneous content in the classroom [3], which represents a major handicap, given that all responses must be carefully checked and cross-verified. The existence of a percentage of copying or replication in the generated responses is a risk that professors must manage with caution to avoid plagiarism issues and ensure that the use of AI does not compromise academic integrity [35].

One of the most debated concerns regarding the use of GAI in education is its potential impact on students' critical thinking skills. Specifically, there is a prevailing fear that reliance on AI tools such as ChatGPT may lead to intellectual complacency, reducing the need for independent thought and problem-solving abilities [28]. However, our findings suggest an intriguing shift in faculty perceptions over time.

The results indicate that the concern that ChatGPT "idiotizes people" (this issue came up in the focus group session) and diminishes critical thinking (P06_07) decreased by 11%, from a mean score of 2.93 in Q1 (July 2023) to 2.62 in Q2 (March 2024). This downward trend suggests that faculty are becoming less concerned about AI's potential to diminish critical thinking as they gain more experience with the tool.

This change in perception could be attributed to several factors:

Greater Familiarity and Awareness. Over time, as educators become more accustomed to AI tools, they may recognise that ChatGPT is not inherently a threat to critical thinking but rather a tool that can be used strategically to enhance cognitive engagement [12]. For example, rather than replacing analysis, AI can serve as a starting point for discussion, debate, and deeper inquiry.

Integration into Pedagogy. The reduction in concern might also reflect a shift in how faculty are integrating ChatGPT into their teaching. Instead of allowing students to passively consume AI-generated responses, educators may be incorporating AI-driven prompts that require students to critically evaluate, refine, and challenge AI outputs [38].

Recognizing the Dual Role of AI. The change could signify a growing understanding that AI does not inherently "idiotize" users, but rather, its impact depends on how it is used. If students are encouraged to interact with AI critically, fact-checking, refining, and improving AI-generated content, the tool can actually promote deeper engagement with course materials rather than diminish cognitive rigor [34].

Reduced Technological Scepticism. The initial fear of AI potentially making students intellectually lazy may have stemmed from unfamiliarity or misconceptions about how these tools operate. As faculty engage with ChatGPT more frequently, they may realise that the AI itself does not inherently weaken intellectual capacities, but rather pedagogical approaches determine whether it fosters or hinders critical thoughts [40].

Apart from the above explained factors, the aim of this study is mainly to contrast two hypotheses:

Hypothesis 1 (H1): As time passes, using GAI, specifically ChatGPT, increases the perception of its advantages over the disadvantages.

Hypothesis 2 (H2): As time passes, using GAI, specifically ChatGPT, increases the willingness towards its integration and use in educational practice.

As an initial conclusion of the analysis, H1 is not rejected, given that the mean of the perceptions of the advantages exceeds the mean obtained for the disadvantages or barriers over time in all the executed tests, and there is also greater positivity and consensus in the evaluation of the advantages over the disadvantages.

On the other hand, H2 is rejected, and as well, the question measuring intention to use ChatGPT (Q11) shows a decrease of –6% with no significant difference between the Q1 and Q2 scores (eight months apart), which might suggest that, although professors are aware of the advantages, some of them are not yet convinced or ready to adopt this technology in their daily practice. This contrast between the positive perception of the tool's impact and the decrease in intention to use it indicates the need for further support or additional resources to facilitate the effective implementation of GIS in the classroom.

As age and length of time pass ChatGPT use increases, and there are more perceived advantages compared to disadvantages. More experienced users rate the advantages highly and perceive fewer disadvantages, suggesting that familiarity and mastery of the software tend to improve their rating. However, those with very few hours of use (less than 2 hours) seem to find greater disadvantages.

We can also affirm based on the analysis data, that over time there's an improvement in professors' perceptions of their own technical knowledge, integration in the classroom and the impact of ChatGPT on student learning, not to mention that professors are reluctant to use it without guidance, support, associated resources or consistent regulation [14].

6 CONCLUSIONS

It is clear from the analysis that the creation of activities cases and the generation of texts for teaching purposes are the greatest advantages, according to the professors' perspective of using ChatGPT in the classroom. Regarding the perceived handicaps of using the GAI, the highest concern ratings are associated with failures, errors, or inaccurate answers, the cost or monthly price and finally, ethical responsibility and the possibility of plagiarism, which continues to generate a certain degree of concern.

The study reveals that faculty concerns over misinformation, ethical implications, and integration barriers persist. While faculty develop greater confidence in using ChatGPT over time, their actual willingness to adopt it in daily teaching has not significantly increased.

Key findings suggest:

- Faculty perceive more advantages than disadvantages as they gain experience.
- Technical and ethical concerns remain, requiring institutional support.
- Training programs should focus on practical integration strategies to increase adoption.

The –11% decrease in concern over ChatGPT's potential to "idiotize" students suggests that faculty are becoming more confident in the tool's role in education and less apprehensive about its impact on critical thinking. As AI becomes more embedded in academic settings, its role will likely continue evolving, requiring thoughtful pedagogical strategies to maximise benefits while mitigating risks.

The findings of our study provide a solid basis for the development and implementation of professor training programmes aimed at strengthening the understanding and effective use of GAI in higher education.

The findings show that professors perceive more advantages than barriers; however, there remains a reluctance to generalise the use of GAI. This highlights the need for specific workshops to train professors in the effective use of this type of tool. In addition, the study may support the development of a guide for the formulation of educational policies that establish a roadmap for the integration of AI in the classroom, ensuring that institutions address the barriers identified—such as the need for greater faculty confidence and preparation.

Furthermore, this study contributes significantly to the debate on the efficacy and ethical implications of using AI in education. The findings may serve to guide future research on technology adoption in various educational contexts, providing crucial information for AI developers and enabling improvements or adaptations that better address the needs and concerns of the education sector. To paraphrase one of the professors who participated in the study: "ChatGPT helps but it is not a total solution." These results reinforce the importance of maintaining a balanced approach to technology integration in education, where institutional support, adequate resources and continuous professional development are key to effective and ethical implementation of AI in education.

For future research, expanding the sample size would be beneficial to increase the robustness of the findings. It would also be valuable to replicate the study to ensure temporal traceability and observe how perceptions and use of technology evolve over time. Additionally, including more socio-demographic and technology related questions would enable the development of more accurate statistical models of causality, facilitating a more in-depth analysis of the results.

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8 CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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