# University Teaching and AI: A Well-Matched Couple? Reflections Based on Student Expectations and Perceptions

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**ENG Abstract.** The present study analyzes how Artificial Intelligence impacts the role played by faculty in the learning process, based on a study of perceptions and expectations conducted among students enrolled in Social Sciences during the 2023/2024 academic year. The results suggest that students perceive faculty as a barrier to the use of AI in learning. Additionally, two important findings stand out: the use of AI in learning activities shifts students from AI-skepticism to AI-philia in just a few months, and it also generates a new paradox between the "democratization" of access and the "elitism" of exploitation and use of outcomes.

**Keywords:** Artificial Intelligence, university learning, teaching staff, student body, social research.

**Summary:** 1. Introduction. 2. Artificial intelligence and learning: state of the question. Methodology of the study. 3.1. Objectives, research questions and hypotheses. 3.2. Research method and techniques. 3.3. Sample of the study and data exploitation tactics. 4. Results. 4.1. Expectations about the impact of AI on teachers' work. 4.2. Expectations about the impact of AI on the academic process and product. 4.3. Expectations about whether AI will facilitate the acquisition of competencies. 4.4. Perceptions after the use of AI in the classroom. 5. Discussion. 6. Conclusions. 7. Acknowledgments. 8. Bibliography.

## 1. Introduction

The purpose of this study is to analyze the impact of new applications of Artificial Intelligence (AI) on the role played by teachers in the learning process, based on a study of perceptions and expectations carried out on university students studying Social Sciences.

The reality is that AI, understood as the technology that seeks to simulate through various resources human actions and our way of reasoning and learning, is spreading as if it were a force of nature; and its effects and potential have been discussed in various areas (medicine, politics, judiciary, human resources management, etc.) and there is even a considerable academic production on its influence on teaching. However, the analyses that incorporate the role of teachers in this new stage, as seen by the student body, are non-existent or fragmentary. In short, as García-Peñalvo (2023) points out, with the emergence of ChatGPT and other generative applications of conversational intelligence, we are witnessing the transition from a toy technology to another that poses a disruptive innovation, and which generates expectations and fears in equal parts. The academy cannot stay on the sidelines in this debate.

However, the academic discussion, in which eminent experts have intervened, despite identifying teaching and learning as priority areas that will be affected by the use of artificial intelligence, has not considered, except on rare occasions, the perceptions and expectations of the student body, the true protagonist of university learning. One of the objectives of this study is precisely to try to mitigate this deficit of studies on the position of students with respect to AI, and how they think professors should react. Significant findings will be found in it, such as the fact that the students surveyed, despite the importance given to the issue socially and in the media, do not *currently* expect major changes either in the teaching organization of the academic product or in the competencies associated with learning. Another interesting aspect is the verification that their view becomes more favorable to its introduction in university learning, to the extent that the students have experienced the use of AI in a guided way in some subject, identifying the faculty as a blocking factor.

The development tactic begins by presenting the state of the question regarding the relation between AI and learning, followed by an explanation of the methodology (objectives, questions, hypotheses, sampling data and data exploitation tactics). Subsequently, the main findings of the social research carried out will be presented, which will then be placed within the framework of the academic discussion on the impact of AI. Finally, the most relevant conclusions will be presented.

## 2. Artificial intelligence and learning: state of the question

The concept of artificial intelligence (AI) has been the subject of debate since its emergence and definition in the 1950s, affecting both the type of "intelligence" that machines can have and their influence in the field of learning. The evolution of AI studies, from early symbolic approaches to those based on neural networks, has influenced the way we teach and learn.

As pointed out by Gómez-Pérez (2023), the concept of AI has varied over time and, as an example, the dictionary of the Real Academia Española (RAE) in 1992 incorporates this locution and indicates that it is "that attributed to machines capable of performing operations typical of intelligent beings". This definition was updated in 2001 to indicate "the development and use of computers that attempt to reproduce the processes of human intelligence". Finally, the dictionary in 2022 defines AI as "the scientific discipline that deals with the creation of computer programs that perform operations comparable to those performed by the human mind, such as learning or logical reasoning".

Technical studies often cite the importance of Turing's work in early approaches to AI, and in particular the famous test about how a machine is intelligent if it is able to mimic human behavior without a human supervisor being able to determine whether the results are from a person or not (Turing, 1950). It is true that Turing did not directly address the relation between AI and learning, but his conception that key human functions can be replicated by machines was an initial step towards automated learning.

McCarthy (1956) pioneered the development of systems based on formal language and logic that emulated human thought and coined the term "artificial intelligence". His work had a direct impact on learning, as McCarthy's principles of formal languages are at the basis of, for example, computer-assisted learning systems, and McCarthy himself considered that machines would not only perform tasks but could learn from interaction with people.

Parallel to the previous authors, the work of Simon and Newell (1972), or their Theory of Problem Solving, in which they showed how machines could simulate the human process in the formulation of decisions and problem solving, stands out. This theory is at the basis of tools that make it possible to improve learning, through the development of cognitive skills based on complex thinking and dilemma solving. Furthermore, Simon defended the idea that learning is a fundamentally computational process.

Somewhat later, MIT AI lab co-founder Minsky (1986) decisively influenced AI research through his theory that the human mind is composed of a cast of actors or agents that, working together, produce intelligent behaviors, which has influenced the studies of deep and machine learning models, essential in contemporary approaches to AI. This would enable an improvement of the teaching process through machines analyzing large volumes of data and the development of interactive and simulated learning environments.

More recently, it is worth highlighting the work of Rumelhart et al. (1986) and LeCun et al. (1998), who have spearheaded research on neural networks and deep learning, projecting AI towards more sophisticated teaching models by identifying complex patterns in data and predictors of people's performance. In this way, Machine Learning improves the educational experience through, for example, platforms that can adapt in real time to the needs of students.

The previous authors show that AI and its direct or indirect impact on aspects relevant to coexistence and innovation have been studied for years (Mairal 2020), but it is in education where, since the emergence of ChatGPT and its open access in November 2022, together with the multiplication of new applications of conversational intelligence, it has the potential to cause a disruptive change in the learning process.

Of the different perspectives in which the impact of AI can be approached (macro, pointing out how it influences society and its main institutional actors; meso, taking into account its impact on a specific sector—for example, health or education—by analyzing the institutional regulatory response given by the main authorities of the sector; or, micro, by analyzing how the main actors involved in the direct use of AI applications react in the operational sector), in the present analysis we have favored the micro approach, analyzing the role of one of the actors (the teaching staff) in the eyes of the real protagonists of learning (the student body). It is at this micro level that studies supported by empirical data are scarcer. Therefore, of the various possibilities that arise according to Wang and Cheng (2021) (learning with AI, learning about AI and preparing to learn how to learn in the era of AI) our work focuses on the first two: learning about AI, to learn using AI and, in this framework, through the evaluation of the teaching role in the new learning context as seen by the students. This research decision does not prevent us from recognizing the importance of studies that raise ethical dilemmas and systemic impacts of all kinds that AI raises for today's society, or even those related to the main decisions to be taken by political and administrative authorities on its impact on learning.

Precisely the latter concerns the most relevant international institutions in terms of education. Thus, the Beijing Consensus on Artificial Intelligence (UNESCO 2019) has sought to provide adequate responses to the challenges posed by AI, putting forward a complete set of recommendations among which stand out, for our interests, the need to educate in AI to support teaching and teachers, and to take into account its use in learning and assessment. A more detailed analysis of the relation between AI and education, intended for policy makers, can be found in UNESCO (2021). Finally, stakeholders collectively representing higher education institutions, such as the European University Association (2023) indicate the importance of the responsible use of AI in higher education, and its impact on student assessment, proposing to move from discussion to the creation of standards of use as stakeholders are already using AI with some intensity (Muscanell and Robert 2023).

On the other hand, the academic literature on AI, and its impact, has multiplied since ChatGPT was made available to the public in a Freemium format, so studies that perform systematic reviews of the most important journals are welcome. The study by García-Peñalvo et al. (2024), analyzing what happened in the six months following the emergence of ChatGPT in open format, concludes that the number of studies on AI in education has multiplied in the most reliable databases (WoS and Scopus), and although at that time there were dozens of studies, today they could be counted in the hundreds.

From the outset, although in some extremes there is a relation, research on the use of information and communication technologies in university learning (of which there is evidence in the field of mathematics—García Paredes et al. 2023), of the evaluation of the virtual learning environment (Fuentes Aparicio et al, 2021), or regarding the practicum (Poveda et al. 2021), to name but a few, should not be confused with research on AI in the framework of conversational intelligence.

Studies had already been warning us that AI could allow better personalization of learning (Acosta, 2022) (adapting rhythms according to the situation, location and needs of the student), together with synchronous (Vergara, 2023) or asynchronous virtual assistance (Cotton et al. 2023), which would result in an increase in the quality of teaching (Forero, 2020) (using instruments that identify deficits and areas for improvement through the use of automatic learning algorithms and specific feedback instruments) and even anticipating the happy disappearance for teachers of all those bureaucratic burdens that in some cases have taken over the teaching process (Choi et al. 2023) (Lee 2023). International organizations of the importance of UNESCO highlight that, although there are not many results on how teachers and students are adapting to the use of AI, it can be inferred that there is potential for improvement in the educational process if the correct use is made of it (UNESCO, 2019 and 2021).

Regarding the role of teachers, in addition to favoring the personalization of the learning process and providing real-time feedback, it should be seriously considered that they acquire additional skills and competencies to ensure effective learning (Mejías et altr. 2022), so there is no lack of those who invite to initiate a debate, which is expected to be uncomfortable, on the role of teachers in this new "learning ecology permeated by complex thinking" (García-Peñalbo, 2023).

Therefore, it can be established that most studies on the application of AI to learning tend to focus on the potential of its introduction for a more personalized, autonomous and inclusive learning, without ignoring the possible dysfunctions and, with respect to comparative research, it is worth noting the absence of similar and recent empirically based studies applied to university students of Social Sciences, inquiring about how they view the academic product and the role of teachers in this context.

## 3. Methodology of the study

### 3.1. Objectives, research questions and hypotheses

The purpose of this research, to know the expectations and perceptions of students about the impact of AI on the role of faculty in university learning, is divided into two research questions:

Question 1: How does AI impact the role of faculty in the university learning process?

Question 2: Are there differences between expectations and perceptions of that teaching role from the use of AI in the classroom?

With the answer to these research questions, after presenting the findings obtained from the empirical work in the light of the published research on the impact of AI on university learning, we intend to verify the following hypothesis: teachers positively assume the use of AI in university learning in the eyes of the student body. The interest of this hypothesis lies in the importance of teachers in the teaching process, since they control essential technical, relational, emotional and motivational elements that are part of the infrastructure that promotes learning. And also because, according to the academic literature, teachers could be one of the actors most benefited by the introduction of AI in their subjects, since it would allow them to spend less time on repetitive tasks, such as answering uncomplex or procedural questions, which, in addition to allowing an increase in productivity, could open the door to the performance of higher value-added tasks such as those involving critical and motivational personalized comments (Choi et al.2023) (Khan et al. 2023).

The logical steps, or objectives followed to answer the research question have involved the following milestones:

1.  To know the status of national and international publications on AI in relation to university learning, with special emphasis on the role of faculty.
2.  To carry out empirical work, using quantitative and qualitative techniques to obtain information directly from the student body.
3.  To analyze, in the light of international experience and empirical research, the role that teachers should play in the scenario generated by the irruption of new AI tools.
4.  To draw meaningful conclusions about how the student body views the role of the faculty, and its modification, due to the emergence of AI in university learning.
5.  To answer the research questions and the associated hypotheses.

### 3.2. Research method and techniques

Given that the empirically based scientific literature on the specific object of this study is very scarce, we have chosen to carry out an exploratory and analytical study. The aim is to provide a general narrative description, based on the use of socio-empirical research techniques, in order to interpret and rigorously present the reality under analysis.

The research techniques have privileged a qualitative and quantitative approach. In addition to the mandatory analysis of the literature and administrative documents on AI and its impact on teaching, as indicated above, empirical work was carried out on university students of Social Sciences, which made it advisable to use quantitative data analysis techniques (for the closed questions) and qualitative techniques (preferably discourse analysis for the open questions).

The questionnaire answered by the student body was quite extensive and combined closed- ended and open-ended questions on the overall impact of AI on university learning. Of all the questions, for the purposes of this article, we have selected those that focused on the role of professors and the academic product, as follows:

-   If students use AI in their work and other activities, how do you think teachers could assess what each student has actually learned?
-   What risks do you perceive in the use of AI applications in university learning?
-   How do you think the use of AI applications will affect the academic process?
-   Taking into account the possibilities provided by AI and its applications to the field of learning, how do you think teachers should act?
-   How would you define the impact of AI applications for your university learning right now?
-   How will AI and its applications affect the acquisition of skills related to university learning?
-   After the experience of use, how do you perceive the predisposition of the teaching staff towards AI? And that of the students? How has it affected their learning?

Lastly, it should be noted that the students answered two related but different questionnaires: the first, at the beginning of teaching in the different subjects; and the second, at the end of the course in which they had the opportunity to carry out some practice involving the use of AI. The first was used to measure expectations, while the second was used to measure perceptions.

### 3.3. Sample study and data exploitation tactics

The empirical work consisted of the elaboration and application of a semi-structured questionnaire, self- administered through the Virtual Campus and of voluntary response, on students of the various undergraduate and master's degree programs taught in the Facultad de Ciencias Políticas y Sociología of the Universidad Complutense de Madrid (UCM) in the 2023/2024 academic year. The universe of the study consisted of 2842 students and the responses obtained (sample) amounted to 332 in the first questionnaire, and a similar number in the second. The sample is representative of the indicated universe with a confidence level of 95% and a margin of error of +- 5%, thus allowing inferences to be drawn with a high degree of reliability. That said, it should be considered that, since the response is a voluntary act by the student body, the people who responded could be those who are closer to the AI applications, or more interested, as opposed to those who simply chose not to respond. Obtaining a random sample at the risk of not achieving sufficient response rates was sacrificed for the sake of obtaining greater participation through the voluntariness of the response.

Another possible bias would be that of authority, although the data do not confirm this, and would consist of a conditioned response on the part of the students to the importance given to the study and use of AI in the classroom by the teachers involved. This bias of authority was mitigated by the teachers, since in the previous meetings they organized the way to present the AI applications in an aseptic way, without prejudging their potentialities or dysfunctions.

It is interesting to note that the questionnaires were answered especially by students of the following degrees: International Relations (21.1% of responses), double degree in Politics and Philosophy (15.7%), double degree in International Relations and Business Administration and Management (15.7%), Degree in Political Science (13.9%) and, at a greater distance, Degree in Sociology and Master's Degree in Government and Public Administration.

On the other hand, the questions in general asked to show the level of agreement with different statements, for which 5 grades were proposed: 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), 5 (strongly agree). Taking this into account, and knowing that the intermediate grade (3) is traditionally associated with indifferent responses, it was decided to exploit the data by comparing in a binary way the sum of the responses obtained from grades 1 and 2 (disagree and strongly disagree) versus the sum of those obtained in grades 4 and 5 (agree and strongly agree), which allows us to contemplate more finely the tendencies indicated by the results. On the other hand, it is interpreted that there is a tendency in the responses when the difference between the sum of the responses in grades 1 and 2, with respect to those given in grades 4 and 5, is greater than +- 10%.

## 4. Results

The results obtained from the socio-empirical study are presented below. For this purpose, we first relate the data on expectations about the impact of AI on the work of teachers, on the academic process and product, and on the acquisition of competencies; and, subsequently, the data on perceptions.

### 4.1. Expectations about the impact of AI on teachers' work

One of the problems that can be foreseen as a result of the intensive use of AI by students is difficulty in determining the students' real degree of learning, which is why they were asked about how teachers could act to verify it (Table 1). The responses largely support asking students specific live verification questions (53%), conducting content tests without access to any information nor access to the network (46.7%), conducting written exams without access to information nor access to the network (47.9%) and, to a lesser extent, through personalized tutorials (24.7%) or, surprisingly, through assignments in which AI must be used (7.2%). In the open answers, the students indicate the importance of giving space in the tests to reflection, practical activities and collective creation of criteria through class discussion.

Table 1: How will teachers act to verify what they have actually learned?

| If students use AI, how could the teacher assess what they have learned? | % |
|---|---|
| Through specific live questions | 53 |
| By means of traditional written exams | 47.9 |
| By performing tests without documents or access to the network | 46.7 |
| Through personalized tutorials | 24.7 |
| Through the work presented using AI | 7.2 |

Source: own elaboration based on the empirical work carried out

The above connects with the debate on the risks that the use of AI applications may have for university learning, among which students point out the dependence on technology, incorrect use, superficiality and low quality of the knowledge acquired, or the possibility of erroneous learning.

## 4.2. Expectations about the impact of AI on the academic process and product

One aspect of interest is to know how students think that AI will affect the university learning process based on subjects taught by the faculty. Breaking down this process into its main phases, we can differentiate the design of the subject, the preparation of the program, the teaching of theoretical and practical classes, oral presentations by the students and, lastly, its evaluation (see Table 2). Not considering the intermediate or indifferent responses, and comparing the responses received at the extremes, the majority of students believe that the use of AI applications will affect very little the design of the subjects (39.15% vs. 27.71%) and preparation of the program (38.26% vs. 25%), scarcely the theoretical classes (50.90% vs. 26.20%) and the public presentations (presentations of topics or readings by the students) (43.68% vs. 31.92%). However, they do expect it to affect classes and practical activities (24.70% vs. 47.90%), and student evaluation (28.31% vs. 41.8%).

Table 2: Impact on academic process and product

| Process and/or product affected: | %1-2 | %4-5 | NR |
|---|---|---|---|
| Design of the subject | 39.15 | 27.71 | 10.24 |
| Preparation of the program | 38.26 | 25 | 3.31 |
| Theorical classes | 50.90 | 26.20 | 3.31 |
| Oral presentations | 43.68 | 31.92 | 3.92 |
| Practical classes | 24.70 | 47.90 | 3.01 |
| Student evaluation | 28.31 | 41.80 | 3.31 |

Source: own elaboration based on the empirical work carried out

Another interesting aspect is to know the expectations about how teachers should act, taking into account the possibilities offered by AI in the field of learning, from the point of view of the activities developed in the classroom. The data (see Table 3) show that the student body is divided as to whether teachers should continue to teach as usual (32.53% vs. 37.35%). However, they do clearly show their expectations that the situation will not change regarding the insertion of AI in practical classes (39.16% vs. 27.71%).

Even so, students' expectations regarding the impact of AI on learning indicate that its eventual use should not reduce the importance of knowledge-related competencies (75.30% vs. 6.33%) and much less so the competencies related to university ethics and values (85.54% vs. 4.82%).

Table 3: How teachers should act in the face of AI

| Activity: | %1-2 | %4-5 | NR |
|---|---|---|---|
| Teaching as usual | 37.35 | 32.53 | 1.51 |
| Enable AI in practical activities | 39.16 | 27.71 | 10.24 |
| Reduce the importance of knowledge competencies | 75.30 | 6.33 | 5.72 |
| Reduce the importance of ethical and value-based competencies | 85.54 | 4.82 | 3.31 |

Source: own elaboration based on the empirical work carried out

And as a final contrast, students were asked about their expectations regarding how AI applications would affect the acquisition of competencies in university learning in the present and in the immediate future. The intention was that, leaving aside the use that the professor might make of it in his or her subject, they would see themselves as active individuals who could potentially use AI to facilitate their learning in the various academic tasks. The results (see Table 4) show great distrust and skepticism on the matter, since they understand that such use will not allow them to better understand the teacher's explanations (52.41% vs. 23.19%), nor will it allow them to better prepare for mid-term exams (53.31% vs. 23.49%), nor public presentations (45.18% vs. 29.22%), nor facilitate collaborative work (46.39% vs. 23.19%), nor, finally, personal motivation to learn (58.73% vs. 16.27%). Less skepticism, without being optimistic, is shown with respect to the possible use to improve the performance of practical activities (36.45% vs. 30.72%).

Table 4: impact on competencies and learning activities

| Type of competency affected: | %1-2 | %4-5 | NR |
|---|---|---|---|
| Allows a better understanding of the teacher's explanations | 52.41 | 23.19 | 6.33 |
| Allows better preparation for mid-term exams | 53.31 | 23.49 | 5.72 |
| Allows better preparation of public expositions | 45.18 | 23.19 | 5.42 |
| Allows improving personal motivation to learn | 58.73 | 16.27 | 6.02 |
| Allows improving doing practical activities | 36.45 | 30.72 | 5.72 |
| Allows improving teamwork | 46.39 | 23.19 | 5.12 |

Source: own elaboration based on the empirical work carried out

### 4.3. Expectations about whether AI will facilitate acquisition of competencies

The previous view of students as to whether AI favors the acquisition of competencies is deeply pessimistic (see Table 5), except for knowledge competencies, where it is very closely indicated that AI facilitates them (27.71% vs. 35.84%). However, the results are conclusive regarding practical skills and abilities (41.57% vs. 27.41%), socioemotional skills (62.05% vs. 13.55%), those related to the assumption of university values (57.83% vs. 17.7%), or those related to motivation (54.52% vs. 21.39%) and creativity (53.01% vs. 23.80%).

Table 5: impact of AI and competency acquisition

| Type of competence affected. AI facilitates… | %1-2 | %4-5 | NR |
|---|---|---|---|
| Knowledge acquisition | 27.71 | 35.84 | 4.82 |
| Acquisition of practical and application skills | 41.57 | 27.41 | 5.12 |
| Acquisition of socioemotional competencies | 62.05 | 13.55 | 8.13 |
| Acquisition and activation of university values | 57.83 | 17.7 | 6.63 |
| Motivation to learn | 54.52 | 21.39 | 4.83 |
| Creativity | 53.01 | 23.80 | 4.22 |

Source: own elaboration based on the empirical work carried out

### 4.4. Perceptions after the use of AI in the classroom

As indicated in the methodology, the socio-empirical work was carried out at two different times: at the beginning of the course and at the end, taking into account that during the course the students had the opportunity to carry out practical work using AI in one or more of the subjects studied. This feedback, in principle more informed and educated, since they have had experience of use in the classroom, is of great interest as it regards, for example, how the students see the teaching staff and how they see themselves in relation to AI.

Regarding the first point, how they perceive the teachers' predisposition towards AI after the course experience, the data is conclusive (see Table 6): they perceive it as very reluctant to its introduction in learning (20.23% vs. 58.38%), mostly unfavorable (63.01% vs. 13.29%) and very concerned about its use (15.61% vs. 57.23%), considering that AI is not even a source of learning (53.18% vs. 17.34%).

Table 6: Predisposition towards the use of AI in learning (comparison of teachers vs. students)

| How do you see the teaching staff in the face of AI? And the student body? | Teaching staff (1-2)% | Student body (1-2)% | Teaching staff (4-5)% | Student body (4-5)% |
|---|---|---|---|---|
| Mostly reluctant | 20.23 | 78.61 | 58.38 | 7.51 |
| Mostly favorable | 63.01 | 8.67 | 13.29 | 76.30 |
| Concerned | 15.61 | 53.18 | 57.23 | 15.61 |
| One more source of learning | 53.18 | 10.98 | 17.34 | 60.69 |

Source: own elaboration based on the empirical work carried out

Regarding the second point, how students see themselves in relation to AI, the difference in perception is striking, both with respect to how they see the attitudes of the teaching staff compared to their own (see Table 6), but also with respect to what they had shown in their responses to the initial form as their own expectations. In this way, the students do not see themselves as reluctant to AI (78.61% vs. 7.51%), nor do they see it as a major concern (53.18% vs. 15.61%) but are mostly in favor of its use in higher education (8.67% vs. 76.30%) and consider it as another source of learning (10.98% vs. 60.69%).

On the other hand, in the responses based on perceptions (see Table 7), students state that AI is already changing their way of learning at present and that the change will be even more abrupt in the future. They think that the experience of use during the course has allowed them to learn more applications (24.86% vs. 46.82%) and that AI is useful for learning. On the other hand, the results do not show a clear tendency regarding whether AI improves learning (35.84% vs. 33.53%), nor regarding the reliability of the results it offers (32.95% vs. 24.28%), as well as indicating that to make optimal use of it, it is necessary to know a lot about the subject (27.17% vs. 40.46%). Nevertheless, its use in higher education is clearly recommended (30.64% vs. 42.20%), even when aware of the risks involved (18.50% vs. 52.60%).

Table 7: students' perception of AI once used in their learning process

| Impact of AI after its use in the classroom… | %1-2 | %4-5 |
|---|---|---|
| It has allowed me to learn more AI tools | 24.86 | 46.82 |
| It has allowed me to improve my learning | 35.84 | 33.53 |
| I would recommend AI in learning | 30.64 | 42.20 |
| Learning with AI is not reliable | 32.95 | 24.28 |
| AI changes the way I learn in the present | 18.50 | 52.02 |
| AI will radically change the way we learn in the future | 14.45 | 63.58 |
| Despite the risks, the use of AI pays off | 18.50 | 52.60 |
| Its optimal use requires a great deal of knowledge | 27.17 | 40.46 |

Source: own elaboration based on the empirical work carried out

## 5. Discussion

Once the state of the question has been established (see section 2), and after showing the results of the empirical work, we are in a position to indicate the findings of our research within the framework of comparative research.

The first finding of our study is the low enthusiasm with which the surveyed students expect the introduction of AI in their studies, which is consistent with previous studies (e.g., Vicente et al 2023). This is despite the fact that there is a certain awareness of the potential and advantages of its insertion in learning, together with the students' assumption of a certain competence in the use of the best-known applications and their awareness that to a large extent their professional and personal future will be influenced by AI. As will be indicated later, the data changes radically with the experience of use.

The second finding is related to the question of evaluation and the suspicion that with AI, students can "pretend" to have acquired some competencies associated with university education, without really having consolidated them, so it becomes necessary to use means of verification that signify a *moment of truth* in which students must, with no other resource than their own memory, intelligence and other personal skills, and without the help of telematic and written means, give answers to challenges or questions of a theoretical or practical nature. Among these means, it is surprising the support given by students to traditional instruments such as knowledge tests, or to answer live questions, aspects that had been highlighted in previous studies (e.g., Crespo-González et al. 2023). Nor are students unaware of the negative effects of misuse of AI (faked knowledge or poorer quality), together with social and ethical dilemmas (AI requires support instruments that imply a certain economic capacity, or generates biases against those who for physiological or other reasons cannot use it, or do so in a primary way, without taking into account the problems of intellectual property, etc.). Even some students, in the open answers allowed by the questionnaire, showed their fear that the search for scientific truth would be replaced by *the truth* provided by AI, which would somehow lead us to the concept of "algorithmic aletheia" (Sadin, 2020) or tyranny of the algorithm when apprehending and interacting with physical and social reality.

The influence of AI on assessment is perhaps the Gordian knot of the impact of AI on the work of teachers. It is clear that AI can now do quickly and quite correctly activities that have traditionally been used to verify student learning. It may be time to rediscover the teacher's role in assessment through an approach that emphasizes critical thinking, trusting relationships between students and teachers, that is people-centered, and that makes assessment not just a moment of monitoring learning, but part of the learning itself (Rudolph et al. 2023). Some of the above aspects (need for more trust, critical and ethical approach) are pointed out by the students in the answers to the open questions. And finally, there are also authors who propose a greater concern for the process and not only for the final products, constructively reviewing teachers' outlines and intermediate documents (Choi et al. 2023) (Crawford et al. 2023) (Lee 2023).

The third finding is related to the use of AI in the different parts into which the academic product can be divided and in which the role of the teacher is essential. The students express that they do not expect a great impact in the short term on the design of the program, nor on the contents of the subjects, nor on the development of the theoretical classes or the oral presentations; it is only given notable importance concerning the development of the practical and evaluation activities.

The fourth finding expresses the expectation of how teachers should act in the classroom in the scenario created by the introduction of AI. In general, the responses do not show a consensus or a determining tendency as to whether they should continue teaching as usual, nor whether they should allow the use of AI tools in learning activities, although they do advocate that this eventual use should not affect the knowledge-related and ethical competencies that should be consolidated, in addition to requesting more attention to the motivation and emotional management of the student body. Note that we did not ask about the ethics or otherwise of the use of AI, an aspect about which there is much concern among governments and international organizations, but rather we focused on the impact of its use on the generic activation of university values.

The fifth finding suggests that students, understood as active subjects of learning, do not have expectations that the use of AI is affecting their way of learning at the University, since most of them indicate that AI applications do not allow them to better understand the professor, nor to better prepare practical activities or knowledge exams, nor to improve teamwork or motivation to learn. There is no clear tendency, however, regarding the preparation of practical activities. These aspects, derived from expectations, are qualified by the actual experience of using AI in the classroom, as indicated by the data on perceptions.

The sixth finding has to do with the fact that the use of AI is not expected to improve the process of acquiring competencies. This is clearly indicated for practical and applicative competencies, those related to ethics and values, socioemotional competencies or motivation and creativity. There is no clear tendency, however, for knowledge competencies.

The seventh finding is the perception that most professors are not favorable to the use of AI in subjects, being reluctant and concerned, without even giving it the status of another source of learning. This situation contrasts with the students' perception of themselves, since most of them are very favorable to the use of AI in their subjects, not being particularly concerned about it and considering it just another source of knowledge. It should be remembered that these results have been extracted after having had, during the course, experience of the use of AI applications in some practical activity and are therefore worrying because, while the use has made the student body more favorable to the introduction of AI in the classroom, the students generally identify the professors as a blocking factor. The data shows that the AI-skepticism displayed by students in the expectations questionnaire turns into AI-filia once they have had the opportunity to use generative AI applications in learning activities. This does not imply, however, that learning outcomes must necessarily be superior since, as Pataranutaporn et al (2022) point out, the sympathy with which an AI tool (e.g., an intelligent instructor or assistant) is welcomed may generate student motivation, but not always higher scores on learning verification tests.

The eighth finding is the perception that, after having had experience using AI in the courses, students indicate that it has allowed them to learn more tools/applications, to perceive that AI already changes their way of learning in the present and will change it more in the future, so they consider AI as useful for learning and would recommend its use. They only show caution (the respondents do not make a clear tendency) regarding the improvement of the learning achieved and the reliability of what it provides. And they are convinced that the optimal use of it requires knowledge of the subject, which leads to the conclusion that the use of AI benefits the most to those who are most competent in the subject under study. This provides a new paradox that could be formulated as follows: although generative AI has a democratizing effect on access to knowledge, since it makes it possible to produce documents with coherent answers to various topics, the verification of the value and veracity of what it provides can only be carried out by a person who is highly competent in the subject to be dealt with, which runs the risk of falling into a new kind of elitism, that of those who possess these skills, who can use the full potential of AI to their advantage, as opposed to those who will not be able to distinguish whether what is provided is truthful and worthy of consideration, or mere sophisticated artificial noise. This new paradox (AI is "democratic" but "elitist") should be added to those pointed out by Linn et al. (2023): AI is both friend and foe; accessible but restrictive; capable and dependent; more popular the more forbidden.

Finally, it is important to indicate some recommendations for new lines of research, in light of the results obtained. On the one hand, it would be good to carry out more empirically based studies that share concerns and give students, both from the Social Sciences and from other areas of knowledge, a voice. On the other hand, it is advisable that future studies combine qualitative and quantitative techniques. We consider it good practice to use, in addition to questions with closed-ended questions, free-response questions, and also to combine the results with qualitative techniques such as in-depth interviews and focus groups. Finally, we would also welcome more studies that conduct cross-cutting analyses of the university community to comprehensively assess the impact of AI on learning from the perspective of all stakeholders involved: students, faculty, technical and administrative support staff, and academic authorities.

## 6. Conclusions

As we recall, the purpose of this paper is to analyze the impact of AI (through the use of contemporary applications of the ChatGPT type) on the role played by teachers in the learning process, based on a study of expectations and perceptions carried out on university students at the Facultad de Ciencias Políticas y Sociología of the Universidad Complutense de Madrid. After a description of the findings in the development of this work, and after having framed them within the framework of the academic discussion on the subject, the time has come to specify the most significant conclusions regarding the research questions and hypotheses raised.

Regarding the first question, how generative AI impacts the role played by the teaching staff in the learning process, the students' expectations suggest that they do not expect major changes either in the theoretical classes or in the public presentations; they only expect a significant impact on the practical classes and the form of evaluation. Neither are major changes expected with respect to the competencies involved in the learning process, although with nuances in the case of those derived from knowledge. However, teachers are asked to pay attention to motivation and not to neglect ethical and socioemotional competencies.

Regarding the second question, which asks whether there are differences between expectations (with data from the beginning of the course) and student perceptions (with data extracted once AI has been effectively used in learning activities), interesting results are obtained. The first of these is that the student body moves from AI-skepticism shown in the data on expectations to AI-filia, insofar as, despite recognizing that the applications are not yet perfected and not being clear whether they really improve their learning and whether what they provide is reliable, they nevertheless see them as useful and recommend their introduction in the classroom. Another interesting result is the perception that an optimal use of AI tools requires a lot of knowledge about the subject, which raises one more paradox to add to those that scientific literature has been indicating regarding the use of AI in learning: the paradox between democratization and elitism. Indeed, AI can potentially democratize the answers given to certain questions, creating coherent and plausible texts, but in order to be able to determine whether what it offers is rigorous and not mere "artificial noise", it is necessary to have a very high level of knowledge, both on how to use the tools optimally and, above all, on the subject under analysis, so that their use will paradoxically be an instrument in favor of the most and best educated. This could be a new kind of elitism, of an intellectual nature.

Finally, the data on perceptions show that teachers are reluctant and concerned about the use of AI in education, while students see themselves as favorable to its introduction in learning, as they see it as useful and as another source of learning.

In view of the above, it remains to test the hypothesis that teachers positively assumed the use of AI in learning in the eyes of students. In this regard, neither the results of the expectations on how AI will affect the teaching role, nor the results from the perceptions, are optimistic. As indicated, initially, no noticeable impact is expected on the teacher's work (except in practical activities and assessment) due to the introduction of AI; after the experience of use, teachers are perceived as reluctant to use it in the classroom, without even giving AI the role of an additional source of learning. Under these conditions, the hypothesis is refuted. Teachers and generative AI are not a good match. It could even be suggested that students see teachers as a blocking factor in its introduction, which is very bad news since they are called to understand each other for the sake of learning, students and society. Investigating the possible causes of this phenomenon is a new invitation to research.

## 7. Acknowledgements

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