

# Evolution of the Teaching Profile and the Emergence of New Professional Roles in the Age of Artificial Intelligence (AI). A Perspective from Teachers, Students and Professionals

Evolución del perfil docente y surgimiento de nuevos roles profesionales en la Era de la Inteligencia Artificial (IA). Una perspectiva desde docentes, estudiantes y profesionales



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## SUMMARY

This article examines how artificial intelligence (AI) is revolutionising the labour market in Spain, focusing on the creation of new professional roles and the transformation of existing ones. Using a mixed methodology that combines surveys of teachers and students with interviews with industry professionals, the study reveals a collaborative learning model between students, teachers and AI. Educators are evolving from mere transmitters of knowledge to facilitators of learning, taking advantage of AI's ability to prepare content and adapt pedagogical approaches. Students, generally optimistic, identify opportunities in emerging roles such as AI design experts and technology consultants. However, teachers recognise the need to adjust curricula towards these new roles, although with little clarity on which ones will be most in demand. Among professionals, opinions are divided: some believe that AI will enhance current roles, while others foresee the emergence of new positions such as technology anthropologists and bioeconomy experts. The study underlines the importance of lifelong learning, updating skills and integrating values of empathy and sustainability to prepare students for the future of work.

## ABSTRACT

This article examines the impact of artificial intelligence (AI) on the Spanish labour market, focusing on the emergence of new professional roles and the transformation of existing ones. Utilising a mixed-methods approach that combines surveys of educators and students with interviews of industry professionals, the study reveals a collaborative learning model involving students, teachers and AI. The findings of the study reveal that educators are evolving from mere transmitters of knowledge to facilitators of learning, leveraging AI's capabilities to prepare content and adapt pedagogical approaches. Students, generally optimistic, identify opportunities in emerging roles such as AI design experts and technology consultants. However, educators recognise the need to adapt curricula to these new roles, albeit with limited clarity on which will be most in demand. Opinions among professionals are divided: some believe that AI will enhance current roles, while others anticipate the emergence of new positions such as techno-anthropologists and bioeconomy experts. The study emphasises the importance of continuous training, updating skills, and integrating values such as empathy and sustainability to prepare students for the future labour market.

## PALABRAS CLAVES · KEYWORDS

Artificial intelligence; Higher Education; New Professional Roles; Digital Transformation; Teacher Training; Labor Market  
Inteligencia artificial; educación superior; nuevos retos profesionales; transformación digital; competencia digital; formación docente; mercado laboral.



## 1. Introduction

The integration of artificial intelligence (AI) into various industries is reshaping the employment landscape. The advent of automation, data intelligence and emerging technologies is giving rise to new professional roles that require specialised skills and an adaptive approach. This article examines how teachers, students and professionals perceive and prepare for these changes, highlighting the importance of lifelong learning and technological adaptation (Dueñas Zorrilla et al., 2024).

The advent of AI as a transformative technology in the 21st century has had a profound impact on various sectors, including education and the labour market (Floridi et al., 2018; Russell & Norvig, 2020). The automation of tasks traditionally performed by humans, facilitated by advanced algorithms, is a key development in this field (Gwo-Jen et al., 2020). This collaboration between humans and AI systems is creating new opportunities and challenges, particularly in teaching-learning processes (López-Regalado et al., 2024).

Within the extensive domain of artificial intelligence, generative artificial intelligence (GAI) has attained a notable prominence in the fields of education and professional development. In contrast to other forms of AI, which predominantly emphasise data analysis or process automation, GGI possesses the capacity to generate novel content, encompassing automated texts and assessments, interactive simulations, and customised learning materials (OpenAI, 2023; Giannakos et al., 2024). This article focuses on the application and impact of AGI in training and professional practice, delving into the new roles emerging in education and the workplace. It analyses how this technology is redefining the skills needed in the labour market and the profile of the teacher, as well as how teachers, students and professionals perceive these changes.

### 1.1. Teaching Profile Evolution

In recent decades, education has undergone a significant transformation, driven by the advancement of technology and the integration of artificial intelligence (AI). The role of the teacher has undergone a radical change, shifting from a mere transmitter of knowledge to a facilitator of learning. The advent of emerging technologies such as augmented reality (AR) and virtual reality (VR) has been instrumental in fostering more inclusive and effective learning environments, particularly for students with special educational needs (López-Regalado et al., 2024).

AI has emerged as a tool with the potential to transform pedagogy (Luckin et al., 2016). Intelligent tutoring systems and virtual assistants, for instance, assist educators in managing routine tasks and enhance the learning experience by providing immediate feedback (Gunkel, 2020; Selwyn, 2019).

The need for personalisation and adaptation in the utilisation of technology has expedited the evolution of teaching practices, adapting them to the distinctive characteristics of each generation. Millennials, for instance, have been observed to seek detailed information, while Centennials have been shown to prefer more autonomous and practical learning methods (Sánchez-Caballé et al., 2024). Generation Z, comprising current university students, has been found to prioritise a comprehensive education, placing value on their mental and emotional well-being (Samacá-Salamanca, Martínez-Estrella & García-Rivero, 2024).

According to Miller & Bossomaier (2019), AI tools can analyse student behaviour in real time, providing valuable information to improve their teaching methodologies, increasing knowledge retention and student motivation (Selwyn, 2019).

Despite these benefits, some university professionals are concerned about the potential misuse of AI tools, such as plagiarism and academic integrity issues (Bockting et al., 2023 cited in Crawford et al., 2023). However, it is essential that teachers are willing to develop new learning strategies, adapting their teaching and assessment methods to address these challenges (Crawford et al., 2023; López-Regalado et al., 2024).

There is a discernible disparity in the implementation of AI technologies between teachers and students. Students are more adept in the use of digital technologies and tend to explore and utilise a more extensive array of AI tools. Conversely, teachers demonstrate a preference for more familiar and accessible applications, such as ChatGPT (Zawacki-Richter et al., 2019).

The integration of AI within educational settings brings with it a series of challenges, including the necessity for ongoing training and adaptation to emerging technological tools (Dueñas Zorrilla et al., 2024; Holmes et al., 2019). The training of educators emerges as a pivotal solution to address this gap (García & Weiss, 2019). As asserted by McCosker and Wilken (2020), the dearth of AI knowledge among educators can substantially curtail the favourable impact of these instruments within the classroom setting. In the domain of health sciences, AI is enhancing learning and medical research. AI platforms can analyse clinical data to provide precise diagnoses and recommend personalised treatments (Almasri, 2024). For instance, AI systems can analyse images to detect diseases in their nascent stages (Topol, 2019). In the domain of Pure Sciences, the application of AI is predominantly focused on the translation of scientific texts and the execution of complex research endeavours aimed at identifying patterns that are challenging to discern through manual means (Jordan & Mitchell, 2015). Within the field of Arts and Humanities, AI has the capacity to enhance creative processes (McCosker & Wilken, 2020). In the realm of Social Sciences and Law, AI is being utilised to generate content and enhance the interaction with students. Nevertheless, it is imperative that educational programmes in these disciplines incorporate components that nurture critical thinking and originality (Luckin et al., 2016).

## 1.2. Emergence of New Professional Roles

The labour market is undergoing constant evolution, with the advent of artificial intelligence (AI) giving rise to novel professional roles. This transformation is evidenced by the rapid emergence of specific and highly specialised profiles that demonstrate continuous adaptability to technological demands (Mañas-Viniegra & Jiménez-Gómez, 2019). The professionalisation of these roles is driven by the necessity for advanced skills and in-depth knowledge across diverse domains, as highlighted by the growing demand for these technologies.

Temporary employment agencies such as Manpower and Adecco emphasise that demand for technical and digital skills is increasing, with these companies pointing out that emerging roles require a combination of advanced technical competencies and soft skills, such as critical thinking and adaptability (Adecco, 2023; ManpowerGroup, 2023). For instance, professions such as AI and machine *learning* specialists, data analysts, AI ethics managers, prompt engineers, and robotic automation experts are emerging as vital to the modern economy (Chui et al., 2016). According to the World Economic Forum, it is estimated

that by 2025, 97 million new roles will emerge, adapted to the new division of labour between humans, machines and algorithms (World Economic Forum, 2024).

### 1.3. Justification and Objectives

The primary objective of this research (O1) is to identify and analyse the novel professional roles that are emerging in conjunction with the advancement of artificial intelligence (AI), and to assess the competencies and skills required to perform these roles effectively. Furthermore, this study seeks to understand the perceptions and attitudes of teachers, students and professionals regarding these changes (O2), with a view to providing recommendations for improved preparation and adaptation to the new work environment. The study also seeks to compare the perceptions and attitudes of teachers, students and professionals (O3), highlighting the need to strengthen the training of educators in emerging technologies and assessing whether there are notable differences in perceptions and attitudes towards AI based on demographic variables such as gender, age and area of knowledge of the participants (O4).

To this end, the following research questions (RQs) have been formulated: do new professional roles emerge with AI, or are they a continuation/amplification of existing roles; what competences and skills are considered crucial to perform the new emerging roles in an AI-dominated environment; and how do teachers, students and professionals perceive the impact of AI in their respective areas of work and study; whether there are salient differences in perceptions and attitudes towards AI based on demographic variables such as gender, age and area of expertise; and whether there are salient differences in perceptions and attitudes towards AI based on demographic variables such as gender, age and area of expertise.

## 2. Methodology

A mixed research methodology was employed in order to conduct this study. The initial phase of the study comprised a comprehensive literature review, the objective of which was to establish a theoretical framework on new professional roles driven by AI. This review yielded a solid theoretical framework and facilitated the identification of knowledge gaps and areas of interest for the survey.

The second phase of the study consisted of the administration of an online survey, the specific design of which was intended to collect quantitative and qualitative data. The sample comprised 300 participants, with 150 teachers and 150 students from diverse academic backgrounds, including Social Sciences, Engineering, and Health Sciences, among others, and from various geographical locations throughout Spain. The number of participants in each context was meticulously matched.

The data collection instrument was a Google Forms questionnaire, which was designed and disseminated between January and February 2024 via various platforms, including Twitter, LinkedIn and email. Dissemination was conducted through personal contacts, work colleagues, friends and students from different public and private universities in Spain.

The questionnaire was developed by a lead researcher and validated by a fellow researcher, as well as cross-checked by an external expert with a broader background in education and artificial intelligence to ensure content validity. It includes thematic questions

with open-ended and multiple-choice answers, allowing for a detailed insight into the use, applications and opinions on AI in education and its implications for career opportunities. The methodological approach adopted in this study aligns with the guidelines outlined by Almasri (2024) in his systematic review on the impact of AI in science education. Almasri emphasised the significance of leveraging advanced AI tools to personalise learning and provide immediate feedback, thereby enhancing student comprehension and engagement. Additionally, Almasri underscored the necessity to consider both student and teacher perceptions for effective integration of AI in education, a fundamental consideration that was incorporated into the design of the questionnaire.

The survey, administered to both teachers and students, was structured into the following thematic segments:

**Table 1**

*Survey blocks*

Categories	Description
Demographic data	Sex, age, place of residence, area of study, etc.
Knowledge and use of AI	Definition of AI and <i>prompt</i> ; knowledge and use of programmes; access to AI; methods of learning; attitude towards AI
Advantages and disadvantages	Pros and cons of using AI
Future of AI	Impact on education and labour market, needs
Professional roles	Profiles and jobs

In addition, 10 telephone interviews were conducted with business leaders and artificial intelligence (AI) professionals from various areas, such as the metaverse, technology companies, education and HR.

**Table 2**

*Interview participants*

Interviewee	Sex	Position	Company
E1	Man	Metaverse and Extended Reality Specialist	Union Avatars
E2	Woman	Founder	Globalyx
E3	Man	Professor	ESIC
E4	Woman	Managing Director	RH360
E5	Man	Co-founder	Catwalk
E6	Woman	Digital Innovation	Telefónica
E7	Man	Leadership and mentoring specialist	SAULE
E8	Woman	HR Technician	Adecco
E9	Woman	HR Technician	Manpower
E10	Man	HR Technician	Randstad

Each interview lasted between 15 and 30 minutes and took place between May and early July. Professionals were selected through LinkedIn, direct contacts and referrals from friends and colleagues. This approach allowed us to gain broader perspectives on the use and impact of AI, as well as its future application in different professional profiles.

### **3. Analysis and Results**

This section presents and analyses the data obtained from the surveys and interviews with teachers, students and professionals.

#### **3.1. Surveys**

The data obtained from the 300 surveys are presented below:

##### ***3.1.1. Demographic Data***

The study involved a total of 53% male and 47% female teachers, with an average age of 47.5 years. The student sample comprised 45% male and 55% female participants, with an average age of 22 years. The distribution of students by educational qualification was as follows: 60% held a Bachelor's degree, 20% had a Master's degree, 15% participated in vocational training, and 5% were enrolled in other educational programmes.

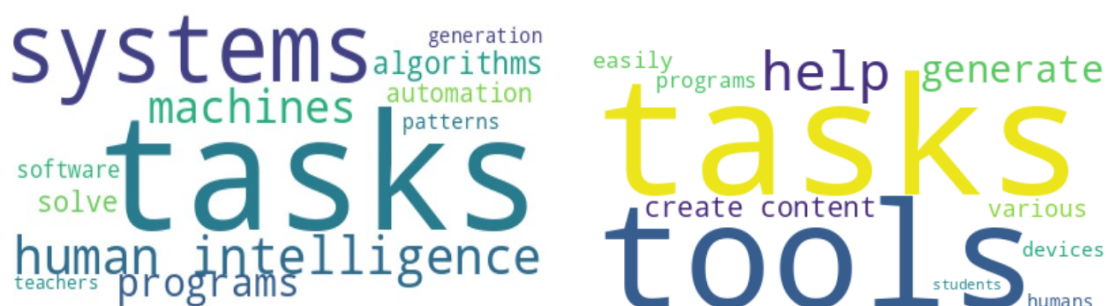
##### ***3.1.2. Knowledge and Use of AI***

In a survey of teachers and students, it was found that 100% of teachers and 95% of students claimed to be familiar with the concept of Artificial Intelligence, while 95.7% of teachers and 60% of students indicated that they knew what a prompt was. The survey revealed that teachers, both male and female, possessed comparable levels of knowledge regarding AI, associating it with machine-generated tasks and patterns. The most frequently cited definitions included 'the capacity of machines to carry out tasks through algorithms that require human intelligence' and 'the generation of patterns that manage to automate certain tasks.' The students describe AI as a tool that performs tasks that would normally require human intelligence, facilitating processes and optimising time. They refer to it as 'a programme that has been trained with language information and general knowledge capable of understanding and answering complex questions in a human-like tone' or as 'a technology that has human-like capabilities'.

These word clouds visualise the most repeated terms in their definitions, where the size of each word indicates its frequency of mention. Teachers emphasise terms such as 'machines', 'tasks', 'algorithms', 'human intelligence' and 'systems', while students highlight 'tools', 'help', 'generate' and 'content'.

**Figure 1**

*Word clouds provided by students and teachers*



Source: Own elaboration.

The definition of the term 'prompt' is one of consensus amongst teachers and students, who generally refer to it as a 'command or description that a human gives to a machine to perform a task'. A preliminary analysis of the data indicates that male participants tend to provide more technical details than their female counterparts.

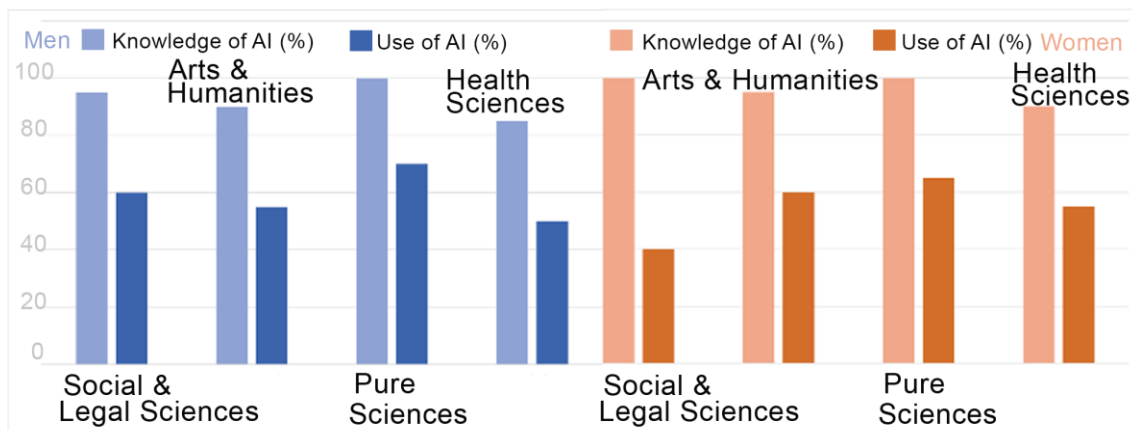
The study found that teachers use AI programmes for the creation of educational content, such as preparing class material or generating exam questions. They also use AI to automate the assessment of assignments and improve interaction with students through personalised tutorials.

The most prevalent and widely utilised tools are ChatGPT, DALL-E and Midjourney, with no discernible disparities in tool preference between men and women. However, variations emerge in their utilisation across different subject areas. Women in the Arts and Humanities demonstrate a more cautious approach to tool usage, while those in the Pure Sciences exhibit a more open and experimental stance.

Students primarily employ AI software for academic and creative endeavours. In contrast, men exhibit a more expansive range of tool usage, encompassing ChatGPT, DALL-E, Midjourney, Copilot, Stable Diffusion and Runway. These tools are employed for diverse purposes, including design, image generation, content creation, information retrieval, problem-solving, and mathematical tasks. Notably, men also demonstrate a propensity for programming and utilizing AI to answer specific questions. Women, on the other hand, primarily engage with AI tools for searching information, generating ideas, and creating academic content. They utilise tools such as ChatGPT and Firefly to search for texts related to their studies, structure and outline papers, and generate images and text for inspiration. Women tend to employ AI for academic support and to enhance the organisation of their assignments, focusing on obtaining explanations of concepts, producing summaries and tables, and solving university questions. They also use AI for personal projects.

**Figure 2**

*Knowledge and use of AI by area of study and gender*



Source: Own elaboration.

As demonstrated in Figure 2, there is a higher level of awareness of AI among female participants in all subject areas, particularly in the Social Sciences and Pure Sciences. However, this does not translate into equal usage, with female participants tending to use AI less than their male counterparts. In contrast, male participants demonstrate a more balanced understanding of AI and its application. This discrepancy is particularly evident in the Social Sciences and Law, where female participants excel in programme knowledge but not in its practical use. It is noteworthy that women demonstrate superior performance in the utilisation of AI in Health Sciences and Arts and Humanities, surpassing their male counterparts. Teachers and students frequently opt for free versions of AI tools due to budgetary constraints or the exploratory nature of their endeavours. However, some select paid versions to access advanced features that enhance their performance. Self-taught learning is the predominant method for both groups: 56.3% of male teachers and 58.3% of female teachers, as well as 62.5% of male students and 55.6% of female students, prefer this modality, indicating equal access to self-taught resources.

However, a higher percentage of female teachers (20.8%) and students (23.3%) reported relying on recommendations from friends or experts compared to their male counterparts (12.5%). It is noteworthy that these training programmes were provided by educational institutions themselves. Among students, 16.7% of males and 22.2% of females expressed a desire for more specialised training. While the proportion is higher for women, the chi-square test was employed to ascertain the statistical significance of this discrepancy compared to their male counterparts. The test results yielded a chi-square value of 1.75, a degree of freedom of 1, and a p-value of 0.185. This p-value is greater than the assigned significance level (0.05), indicating that there is no statistically significant relationship between gender and the pursuit of specialised AI training. This suggests that, regardless of gender, students tend to resort to self-taught learning, a common approach observed in all fields of study.

### **3.1.3. Advantages and Disadvantages**

The efficiency, personalisation and innovative potential of artificial intelligence (AI) in education are emphasised by both groups. AI has the capacity to save time, provide

personalised resources and encourage self-directed learning, with 55.3% of teachers believing that it improves the learning process.

However, a number of disadvantages are also noted, including over-reliance on technology, the potential to promote plagiarism and the lack of personal effort among students. Concerns regarding the equity of access to technology are also shared. In addition, there are concerns that inappropriate use of AI can lead to misinformation or misinterpretation of data.

In terms of its application in the classroom, teachers recognise the usefulness of AI for personalising learning, improving efficiency in lesson preparation and student assessment, as well as for integrating innovative technologies into the learning environment. While both male and female respondents recognise the potential of AI to enhance teaching and learning, a significant proportion of the latter express reservations regarding the use of AI in the absence of critical oversight and the potential for plagiarism and over-reliance. In contrast, a higher proportion of male respondents are more amenable to incorporating AI in their teaching methodologies.

Among the student population, 46.8% expressed support for the integration of AI in classroom settings, while 21.3% expressed opposition to its use. The remaining 31.9% indicated that their stance depended on the specific circumstances. Notably, 85% of students perceive AI as positive and necessary, viewing it as a beneficial tool for learning support, enhancing the completion of assignments and projects, and facilitating exploration of digital technologies and study methods. Furthermore, 80% of students believe that knowledge of AI will contribute to their professional development.

#### *3.1.4. Future of Education and AI*

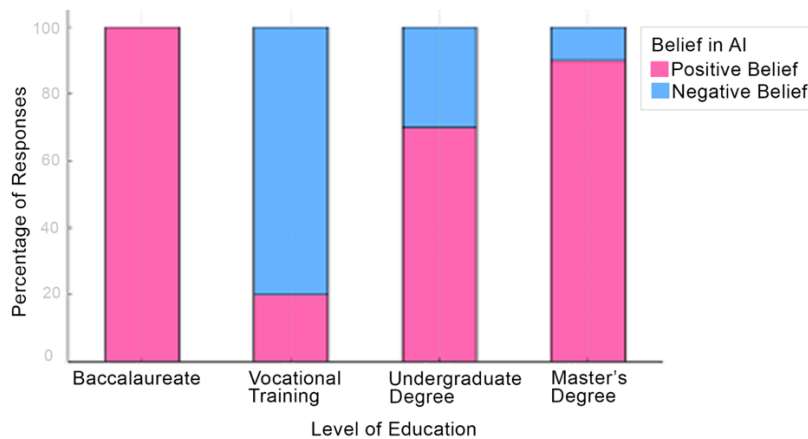
Teachers have recognised the need to adapt curricula to include training in artificial intelligence (AI) and digital skills. However, some have expressed concerns about a possible over-reliance on technology.

87% of male and female teachers agree that AI will significantly transform teaching and learning, although with different nuances. Women emphasise the importance of ethical and supervised implementation. Among the positive views expressed by respondents, the ability of AI to provide more personalised and efficient education, the need to design activities that enhance diverse talents, and the integration of AI into educational processes stand out. It is suggested that AI has the potential to transform the prevailing teaching paradigm, enabling a model in which students, teachers and artificial intelligences learn from each other. Teachers have commented on the transformation of their role from mere transmitters of knowledge to facilitators of learning, highlighting the rapidity with which content can be prepared and the modification of the pedagogical approach. Furthermore, it has been emphasised that AI has the capacity to eliminate traditional memorisation and replace fundamental skills such as logical reasoning, reading and writing, thereby promoting a shift in the forms of assessment towards practical and oral exams, and ensuring the development of competencies such as critical thinking.

13% of teachers who do not believe that AI will radically change education say that while it may have an impact, it will not fundamentally transform teaching.

**Figure 3**

*Belief of AI in finding job opportunities by educational level*

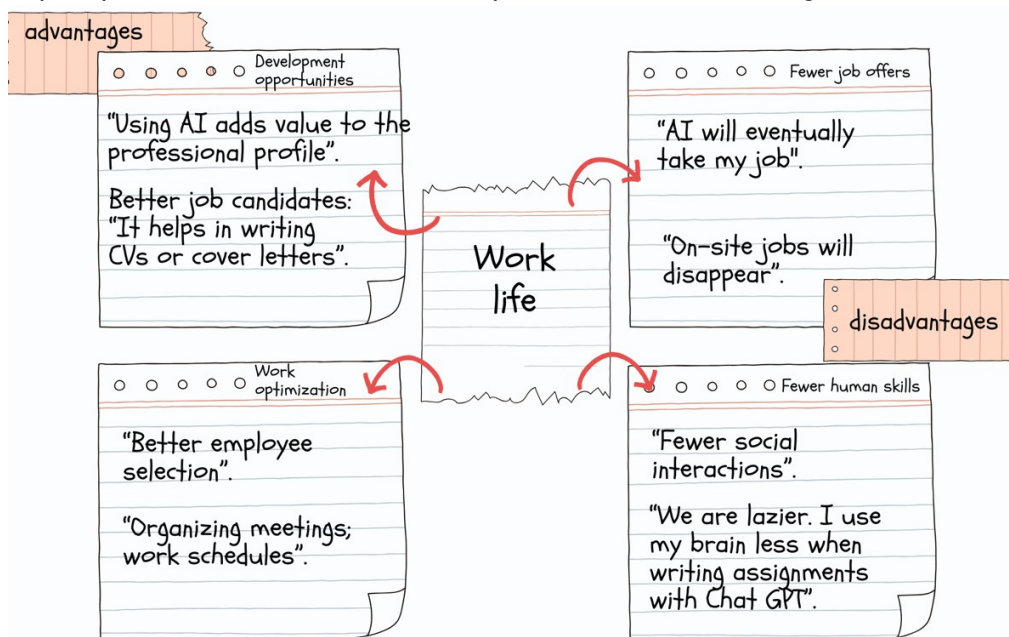


Source: Own elaboration.

Baccalaureate students have been found to demonstrate a greater degree of acceptance of artificial intelligence within the context of their education. Vocational Training (VET) students have also been found to hold predominantly positive views, although some reservations have been expressed. In the case of Bachelor's Degree students, approximately 70% believe that AI has the potential to serve as a valuable tool in the pursuit of employment. Finally, although Master's students maintain a positive attitude, this is somewhat lower compared to Bachelor's students, with about 90% considering AI to be beneficial.

**Figure 4**

*Top responses from students on the impact of AI on their working life*

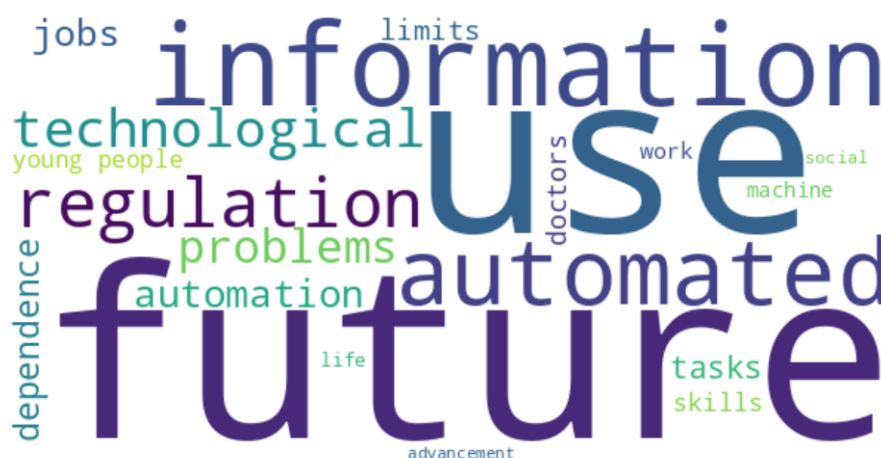


Source: Own elaboration.

As illustrated in Figure 4, students' perceptions regarding the impact of AI on their future employment are nuanced, with both optimistic and pessimistic viewpoints being expressed. The positive stance encompasses the belief that AI will augment students' professional profiles and streamline work processes, such as CV creation and task organisation, thereby enhancing the efficacy of the selection process for prospective employees. Conversely, the negative views expressed by students reflect significant concerns, including the potential for a decline in job opportunities and the displacement of face-to-face roles, as well as the apprehension that AI may lead to a diminution of human social and cognitive abilities, thereby fostering technological dependence and a reduction in social interaction.

**Figure 5**

*Students' word cloud when referring to the future*



Source: Own elaboration.

Figure 5 presents a word cloud pertaining to the prospective ramifications of AI on occupational domains. The word cloud reveals positive perspectives, exemplified by terms such as "automated", "efficiency", and "breakthroughs", which collectively suggest that AI has the potential to streamline processes, enhance accuracy, and democratise information access. Students' anticipations indicate that AI will contribute to time savings and optimised tasks, thereby fostering social and professional development.

Conversely, concerns are reflected in terms such as "loss", "dependence" and "disconnection", suggesting apprehensions regarding the potential erosion of human skills, technological dependency and privacy concerns. Moreover, there is a perception that AI could lead to a dehumanising of work and a reduction in social interactions. The word cloud underscores the necessity for appropriate regulation to ensure a balanced consideration of the advantages and disadvantages of AI.

### 3.1.5. Professional Roles

100% of teachers concur that artificial intelligence (AI) will engender new professional roles, albeit few specify which roles. Some posit that ethics-related positions, such as the ethical compliance specialist, will emerge. They also predict that AI will displace jobs involving repetitive and basic tasks, such as toll collectors, telephone operators and simple

administrative roles. Professions such as graphic designers in small businesses and concept artists in video game studios could also be affected, they say.

Furthermore, AI is expected to transform existing professional profiles, for example in areas such as multimedia design and customer service. Although some roles could change significantly, teachers believe that they will not be completely eliminated. In education, AI could automate certain teaching tasks, such as assessment systems, but it will not replace teachers. It is anticipated that creative and innovative professions, such as teaching, will evolve in response to the integration of AI, resulting in the emergence of new roles such as AI supervisors, whose function will be to ensure the appropriate use of these technologies. Students also predict that while AI may lead to the reduction of some jobs, it will also generate new opportunities, including roles such as experts in AI design, technologists specialising in the application of these tools in various sectors, and technology consultants who will adapt job strategies to new market demands. In the healthcare sector, for instance, AI promises to improve diagnosis and treatment, thereby highlighting the need for trained professionals in this area.

### 3.2. Interviews

The interviews revealed that 70% of participants believe that artificial intelligence (AI) will transform the labour market and generate new professional profiles, with creatives, developers and entrepreneurs being mentioned among those who anticipate the emergence of new positions. These include *prompts* engineer, technological anthropologist, bioeconomy expert, digital real estate specialist, artificial consciousness moderator, futures designer, space and planetary tour guide, and entire new AI departments. Furthermore, it is noted that new specialisms will be created in areas such as law, policing, medicine, aviation and public service, especially where a lot of information is handled.

In contrast, 10% of respondents believe that AI will enhance existing roles rather than create new ones. This group, which includes HR professionals and business leaders, emphasises the importance of continuous training and skills upgrading. They further posit that roles such as programmers, designers, copywriters and data analysts will be pivotal and must adapt to the technology. However, they emphasise that, while technology can enhance processes, it cannot substitute for human labour. A logistics manager proposes that students should adopt a proactive approach to improving their environment and proactively propose sustainable solutions. The director of a manufacturing company underscores the necessity for empathy education to ensure that students comprehend the societal implications of their actions.

The 20% of respondents who believe that both new roles will emerge, and existing roles will be enhanced also highlight lifelong learning. Although the term 'prompt engineer' is mentioned in the report, some respondents think its impact will be limited. Instead, the report suggests that the adoption of AI is more crucial than the creation of new profiles. Professionals such as computer engineers, data scientists, and others in marketing, management, logistics or sales, must constantly update their skills due to the rapid evolution of technology. The contemporary era demands a continuous training approach, adapting to the exponential growth of technologies and the increase of available opportunities. The most important skills that students should develop at university, according to industry, are:

- Knowledge in technology, know how to apply and develop industrial/commercial processes through AI.

- Critical thinking, being able to provide solutions to real problems.
- Having empathy with the environment, know how to work in a team.
- Developing emotional intelligence to motivate dialogue and interdisciplinary work.
- Knowing the meaning of sustainability and applying its values in work routines.
- Maintaining human well-being and seeking balance in society through ethical practices and care for the environment.

#### 4. Discussion and Conclusions

The study reveals a marked difference in the adaptation and readiness towards AI technologies among students, teachers and professionals. For teachers, it is a necessary challenge, and they are aware of the importance of training the next generations with applied skills in virtual reality and artificial intelligence. Conversely, companies assume that graduates will have sufficient knowledge to innovate in productive and creative processes, but do not demonstrate a commitment to the training of new employees. While students demonstrate a greater inclination towards exploring and utilising various AI tools, they do not necessarily employ them for study purposes.

These findings underscore the imperative for enhancing technology training among educators, encompassing both theoretical knowledge and practical skills, as well as infrastructure investment by the education system. This finding is of crucial importance, as the effective adoption of AI in education depends to a large extent on the ability of teachers and the physical resources they have to integrate these technologies into their pedagogical practice, as pointed out by López-Regalado et al. (2024).

Regarding the utilisation of artificial intelligence (AI) in educational settings, the survey outcomes do not corroborate the observations documented by Gunkel (2020) and Selwyn (2019). These researchers emphasised the potential efficacy of AI applications in providing immediate feedback to students, thereby enhancing assessment procedures. However, the surveyed sample of participating teachers does not employ these tools for that specific purpose.

The study emphasises that teachers must evolve their role from educators to facilitators of learning, as both technology and contemporary generations demand learning processes that motivate self-didactic experiences, while simultaneously necessitating comprehensive training that integrates theory with practical applications and generates a tangible impact on the environment. Consequently, teacher training, in addition to incorporating AI tools, should also encompass programmes on emotional intelligence and mental health.

Furthermore, an examination of the available data indicates a correlation between the utilisation of AI tools and the respective fields of study. For instance, those engaged in the fields of Engineering and Health Sciences demonstrate a higher level of engagement with these tools compared to their counterparts in the Humanities and Social Sciences. A further analysis of differences among students reveals that female students predominantly employ applications for the creation of academic content. This observation underscores the necessity for the establishment of novel parameters for educational evaluation and teacher training.

It is also important to note that industry values that students are trained in soft skills, and although they know the application of technology in their fields of study, they must also develop empathy towards their environment and know how to work in a team. These statements confirm McCosker and Wilken (2020).

It is asserted by experts and professionals that with the advent of AI, novel professions are coming into existence, such as technological anthropologists, bioeconomy experts, digital real estate specialists and futures designers. Furthermore, it is emphasised that technology does not substitute for professionals such as programmers, designers, editors and data analysts; on the contrary, it necessitates greater specialisation in the functions they perform, as it will be essential to know how to apply technological tools and comprehend fundamental concepts, as is the case with a prompt. In relation to new professions or roles in the digital age, all fields of study are identified as needing to include practical training in technological applications. These roles demand not only advanced technical skills, but also critical thinking and a profound understanding of the ethical implications of AI. Nevertheless, student perceptions underscore substantial concerns regarding the potential loss of essential human skills and the escalating technological dependence. This discordance between optimism concerning the potential benefits of AI and apprehension regarding its deleterious effects underscores the necessity for suitable regulation and educational policies that promote a balanced and ethical utilisation of AI (Floridi et al., 2018).

In summary, the analysis of the information allows us to establish some recommendations for including the use of AI in the classroom.

- Compare exercises with and without AI to evaluate differences and better understand the effect of technological resources.
- Test various programmes to identify the best tools for learners.
- Teach ethical responsibility, verify information and use AI responsibly.
- Use AI in everyday tasks, such as information search and image generation.
- Allowing students to play an active role in the teaching process, including sharing with the class what applications/tools they use.
- Using AI tools to provide solutions to real problems, show what impact students' actions have on their environment.
- Showing the limits of AI and explaining where it may be less effective, as well as providing pre-service teacher training to train in its use.
- Emphasise that technology is not a replacement for jobs, but rather a useful tool to improve systems, processes and, in general, people's quality of life.

Conversely, the study accomplished its objectives of identifying and analysing the emergent professional roles precipitated by AI, in addition to the assessment of the competency's requisite for the effective performance of these roles. Moreover, it furnished a comprehensive depiction of the perceptions and attitudes of teachers, students and practitioners, underscoring the necessity to fortify the pedagogical training of educators in emerging technologies. However, it is important to note that the rapid evolution of AI means that some findings quickly become obsolete. The limitations of the study, including the limited sample size in Spain and the concentration of interviews in certain sectors, as well as their small number, represent important limitations that need to be addressed in future research.

In the field of research, expanding the sample on an international scale is recommended to achieve a more global perspective. Furthermore, conducting longitudinal studies is advised to capture the evolution of perceptions and the impact of AI over time. In addition to this, investigating how education and lifelong learning policies can be adapted in order to effectively integrate AI into educational curricula. The exploration of the ethical implications and the development of specific regulatory frameworks for AI in different work and educational contexts will be crucial to maximise its benefits and minimise its risks.

#### Author Contributions

Conceptualization, G.B.D. and E.M.E.; Data curation, G.B.D.; Formal analysis, G.B.D. and J.S.S.; Investigation, G.B.D.; Methodology, G.B.D. and E.M.E.; Project administration, G.B.D. and E.M.E.; Resources, G.B.D.; Software, G.B.D.; Supervision, G.B.D. and E.M.E.; Validation, G.B.D. and J.S.S.; Visualization, G.B.D.; Writing – original draft, G.B.D.; Writing – review & editing, G.B.D. and E.M.E.

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The data set used in this study is available upon reasonable request to the corresponding author

#### Ethics approval

Not applicable

#### Consent for publication

All authors have consented to the publication of the results obtained by means of the corresponding consent forms.

#### Conflicts of interest

The authors declare that they have no conflict of interest

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## References

- Asociación para Adecco. (2023). *Employment Trends Report*. <https://www.adecco.com>
- Almasri, F. (2024). Exploring the impact of artificial intelligence in teaching and learning of science: A systematic review of empirical research. *Research in Science Education*, 54, 977-997. <https://doi.org/10.1007/s11165-024-10176-3>
- Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*. W. W. Norton & Company.
- Crawford, J., Cowling, M., & Allen, K. A. (2023). Leadership is needed for ethical ChatGPT: Character, assessment, and learning using artificial intelligence (AI). *Journal of University Teaching and Learning Practice*, 20(3), 2. <https://doi.org/10.53761/1.20.3.02>
- Chui, M., Manyika, J., & Miremadi, M. (2016). *Where machines could replace humans-and where they can't (yet)*. McKinsey Quarterly.
- Dueñas Zorrilla M., Tejada Fernández, J., & Pozos Pérez K. V. (2024). Design and validation of a scale for self-assessment of teaching digital competence and attitude towards educational innovation of in-service teachers. *Revista Complutense de Educación*, 35(2), 239-252. <https://doi.org/10.5209/rced.85257>
- Floridi, L., Cows, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., & Vayena, E. (2018). AI4People-An Ethical Framework for a Good AI Society: Opportunities, Risks, Principles, and Recommendations. *Minds and Machines*, 28(4), 689-707. <https://doi.org/10.1007/s11023-018-9482-5>

- García, E., & Weiss, E. (2019). *The teacher shortage is real, large and growing, and worse than we thought*. Economic Policy Institute.
- Giannakos, M., Azevedo, R., Brusilovsky, P., Cukurova, M., Dimitriadis, Y., Hernandez-Leo, D., ... Rienties, B. (2024). The promise and challenges of generative AI in education. *Behaviour & Information Technology*, 1-27. <https://doi.org/10.1080/0144929X.2024.2394886>
- Gunkel, D. J. (2020). *An introduction to communication and artificial intelligence*. Cambridge: Polity Press.
- Gwo-Jen, H., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education. *Computers and Education: Artificial Intelligence*, 1, 100001. <https://doi.org/10.1016/j.caeai.2020.100001>
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial Intelligence in Education: Promises and Implications for Teaching and Learning*. Center for Curriculum Redesign.
- Jordan, M. I., & Mitchell, T. M. (2015). Machine learning: Trends, perspectives, and prospects. *Science*, 349(6245), 255-260. <https://doi.org/10.1126/science.aaa8415>
- López-Regalado, O., Núñez-Rojas, N., López Gil, O. R., & Sánchez-Rodríguez, J. (2024). Analysis of the use of artificial intelligence in university education: a systematic review. *Pixel-Bit. Revista De Medios Y Educación*, 70, 97-122. <https://doi.org/10.12795/pixelbit.106336>
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence Unleashed: An Argument for AI in Education*. Pearson.
- ManpowerGroup (2023). *Future of Work*. <https://www.manpowergroup.com>
- Mañas-Viniegra, L., & Jiménez-Gómez, I. (2019). Evolution of the professional profile of the community manager during the decade 2009-2018. *El profesional de la información*, 28(4), e280403. <https://doi.org/10.3145/epi.2019.jul.03>
- McCosker, A., & Wilken, R. (2020). *Automating vision: The social impact of the new camera consciousness*. Routledge.
- Miller, S., & Bossomaier, T. (2019). *Cybersecurity, Ethics, and Collective Responsibility*. Oxford University Press.
- OpenAI. (2023). Teaching with AI. <https://openai.com/index/teaching-with-ai/>
- Russell, S., & Norvig, P. (2020). *Artificial Intelligence: A Modern Approach*. Pearson.
- Samacá-Salamanca, E., Martínez-Estrella, E. C., & García-Rivero, A. (2024). Qualitative analysis of the interpersonal profile of centenarians in Colombia and Mexico. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud*, 22(2), 1-28. <https://doi.org/10.11600/rllcsnj.22.2.5919>
- Sánchez-Caballé, A., Cela-Ranilla, J., & Esteve-Mon, F. (2024). Millennials vs Centennials: Different Ways of Learning? *Pixel-Bit. Revista De Medios Y Educación*, 70, 181-193. <https://doi.org/10.12795/pixelbit.105609>
- Selwyn, N. (2019). *Should Robots Replace Teachers? AI and the Future of Education*. Polity Press.
- Topol, E. (2019). *Deep medicine: How artificial intelligence can make healthcare human again*. Basic Books.
- World Economic Forum (2024). *The Jobs Reset Summit*. <https://www.weforum.org>
- Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education - where are the educators? *International*

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