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Artificial intelligence, digital competence and personal hobbies: implications for higher education

Inteligencia artificial, competencia digital y aficiones personales: implicaciones para la educación superior
higher education

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ABSTRACT
In the current context of educational transformation driven by Artificial Intelligence (AI), it is relevant to explore how variables such as digital competence and personal hobbies are related to the use of this technology in higher education. This study analyzes this relationship in a sample of 244 participants (74 teachers and 170 students) from various Spanish universities. A 33-item ad hoc questionnaire was administered, and the data were analyzed using non-parametric tests. The results show that: i) there are no significant differences between teachers and students regarding AI-related hobbies, with non-technological interests predominating; ii) students use AI tools more frequently, while teachers are more involved in content creation through these technologies; iii) students in the Primary Education degree program show higher levels of overall digital competence, especially in information literacy, content creation, safety, and problem-solving; iv) significant differences were observed between universities in digital content creation; v) no significant gender differences were found. These findings contribute to a better understanding of AI use in higher education from a competence-based and contextual perspective.

RESUMEN
En el actual contexto de transformación educativa impulsada por la Inteligencia Artificial (IA), resulta relevante explorar cómo variables como la competencia digital y las aficiones personales se relacionan con el uso de esta tecnología en el ámbito universitario. Este estudio analiza dicha relación en una muestra de 244 participantes (74 docentes y 170 estudiantes) procedentes de distintas universidades españolas. Se aplicó un cuestionario ad hoc de 33 ítems, y los datos fueron analizados mediante pruebas no paramétricas. Los resultados muestran que: i) no existen diferencias significativas entre profesorado y alumnado en cuanto a aficiones vinculadas con la IA, predominando intereses no tecnológicos; ii) los estudiantes utilizan con mayor frecuencia herramientas de IA, mientras que el profesorado destaca en la creación de contenidos mediante estas tecnologías; iii) el alumnado del grado de Educación Primaria presenta mayores niveles de competencia digital global, especialmente en alfabetización informacional, creación de contenidos, seguridad y resolución de problemas; iv) se observaron diferencias significativas entre universidades en creación de contenido digital; v) no se encontraron diferencias significativas según el sexo. Estos hallazgos permiten avanzar en el conocimiento sobre el uso de la IA en educación superior desde una perspectiva competencial y contextual.

KEYWORDS · PALABRAS CLAVES
Artificial intelligence; higher education; digital competence; teachers; educational technology
Inteligencia artificial; educación superior; competencia digital; docentes; tecnología educativa

1. Introduction

Artificial Intelligence (AI) is transforming education by improving teaching-learning processes and automating administrative tasks, allowing for more personalized experiences. According to Rojas (2015), AI focuses on developing machines capable of reasoning and solving problems more efficiently than humans. Its application in education has generated interest in how it impacts students and teachers (Dawson et al., 2023; Flores-Vivar & García-Peñalvo, 2023).

Although the use of AI facilitates the creation of tailored educational content and releives teachers of bureaucratic tasks, it also poses ethical and pedagogical challenges. The United Nations Educational, Scientific and Cultural Organization (UNESCO) (2022) highlights the importance of using AI ethically, ensuring data protection and student privacy. In this regard, Sanabria-Navarro et al. (2023) emphasise the need for a critical approach to balance human-machine interaction in teaching.

Despite the growth in research on AI and education (Valencia & Figueroa, 2023), there is a lack of studies on the relationship between AI, hobbies and digital competence of teachers and students. To address this gap, the article examines the AI tools used by university professors and future teachers at different educational levels, relating them to their interests and extracurricular activities.

This study is relevant because it allows for an understanding as to how hobbies influence the adoption of AI, identifying opportunities to improve digital learning and analyzing the integration of AI in distance education. With a significant sample from the International University of Valencia, we explore strategies to adapt AI to virtual environments, favoring more autonomous and personalized learning processes.

1.1 Approaches to the origins of AI

The period between 1950-1960 is when initial ideas about the possibility of creating artificial entities arose. Alan Turing's contribution during this period is particularly notable: in a 1950 article published in the journal *Mind*, he advanced the notion that machines could think. However, the concept of "Artificial Intelligence" was first coined in 1955, when John McCarthy proposed the organization of a workshop dedicated to this topic during the summer of 1956 (McCarthy et al., 2006).

During the following decade (1960s-1970s), the first programs capable of emulating human reasoning were developed, which gained momentum between the 1980s and 1990s. The latter period gave rise to the emergence of learning approaches inspired by nature, such as artificial neural networks and genetic algorithms.

Towards the end of the 20th century (1990-2000), the foundations of AI were consolidated in areas such as computer science and robotics. It was during this period that AI came into use in the industrial field. This applicability attracted the attention of companies such as Google, which began to invest in the development of AI algorithms.

Since 2010, significant advances in this technology have emerged, making it a fundamental tool across various sectors—from medicine to education—revolutionizing how we tackle complex problems and creating new opportunities for innovation (Russell & Norvig, 2010).

1.2 Use of AI in higher education: opportunities and challenges

The use of Artificial Intelligence (AI) in education has grown significantly, with studies analyzing its benefits and challenges. Although a promising future is in sight, there are ethical implications that require regulation (Flores-Vivar & García-Peñalvo, 2023). Organizations such as UNESCO (2021) and the European Commission (2020) have sparked debates on equity in access and the need for an ethical framework based on privacy, transparency and accountability.

AI in education offers various opportunities, such as improving teaching globally, expanding access to knowledge, optimizing operational tasks and increasing efficiency in various professions (Long and Siemens, 2011). In addition, it facilitates autonomous and personalized learning through academic monitoring tools and optimization of decision making in educational institutions.

However, there are also risks such as a widening digital divide, displacement of workers, marginalization of groups without technological access, and over-reliance on AI. Ethical concerns about data misuse and information privacy also arise.

In this context, generative AI stands out for its ability to create original content, such as texts, images and music (Bonilla et al., 2024). Models such as ChatGPT can enrich teaching through the programming of activities, evaluation and personalization of didactic resources (Flores-Vivar & García-Peñalvo, 2023). In addition, it enables the design of learning tools such as rubrics, educational trivia and interactive stories, adapting the content to the individual needs of students (García-Peñalvo et al.,2024).

Despite its challenges, generative AI represents a key opportunity to transform education and improve teaching through more innovative and personalized approaches.

1.3 Digital competence in a university context

The integration of AI in society has drawn attention to the educational field, generating a growing interest in the level of digital competence of future teachers and active teachers.

According to UNESCO (2021), educational systems must ensure that students are adequately prepared to function in a world where AI has emerged to transform our way of life. In this context, it is essential that both students and teachers possess strong digital skills.

The European Framework of Digital Competence for Educators (DigCompEdu) (Redecker, 2020) defines digital competence as the ability to use digital technologies, not only to improve teaching, but also in their professional interactions. This framework argues that digital competence in education is not limited to the mere use of technologies and thus also implies considering how they are integrated into the teaching-learning processes. It is therefore “part of educators' digital competence to enable students to actively participate in living and working in a digital age” [author’s translation] (Redecker, 2020, p.17). The following table outlines the specific competencies required to facilitate the development of digital competence among the student body (see Table 1).

Table 1

Specific competencies and sub-competencies for the development of students' digital competency

Specific competencies	Specific sub-competencies
Professional engagement	Organizational communication, Professional collaboration, Reflective practice, Continuous professional development through digital media.
Digital content	Selection of digital resources, Creation and modification of digital resources, Protection, management and exchange of digital content.
Teaching and learning	Teaching, Guidance and support in learning, collaborative learning, self-regulated learning.
Evaluation and feedback	Assessment strategies, learning analytics, feedback, scheduling and decision making.
Student empowerment	Accessibility and inclusion, personalization, active engagement of students in their own learning.
Development of students' digital competencies	Information and media literacy, Digital communication and collaboration, Digital content creation, Responsible use, Digital problem-solving

Nota. Redecker (2020, p.25)

To enrich this competency framework, the TPACK model provides a deeper understanding of the skills needed by teachers in a digital environment. This model establishes a conceptual framework for understanding the knowledge a teacher must have to effectively integrate technology into teaching. According to this model, three types of key knowledge are identified: i) technological knowledge (TK), which involves understanding how technology works; ii) content knowledge (CK), which helps us understand the subject to be learned or taught; and iii) pedagogical knowledge (PK), which involves training in teaching-learning strategies and didactics to practice the profession.

The interaction between these three types of knowledge gives rise to three forms of emergent knowledge, derived from the combination of two of them: (i) Disciplinary Content-Pedagogical Content (PCK), which denotes the amalgamation of content and pedagogy without the application of technology; (ii) Disciplinary Content-Technological Content (TCK), where teachers must have a deeper understanding of the subject matter and employ technology to some extent; and (iii) Pedagogical Content-Technological Content (TPK), which highlights “how“ teaching and learning can transform pedagogy and teaching method when technologies are integrated. This fusion involves pedagogical understanding and a strong command of technological tools. The purpose of the model lies in technological

pedagogical content knowledge (TPACK), which is achieved when all three elements converge.

Both the DigCompEdu competency framework (Redecker, 2020) and the skills developed in TPACK will not generate a significant impact on their own. Their effectiveness will lie in how they are integrated into pedagogical practices and how they will transform teaching and learning methods. A review and an update of educational strategies is therefore required to achieve significant changes and take full advantage of the potential of technology in university education.

In this vein, Revuelta-Domíngez et al. (2022) highlight a growing interest in developing teachers' digital competence through training and assessment models, but also stress the need for policy makers to design comprehensive and continuous training plans that can be directly applied to teaching practice in the classroom. Authors such as Spirina (2018), Flores-Vivar and García-Peñalvo (2023) propose that AI and its use should be incorporated into school and university curricula and, therefore, suggest options such as working with AI in extracurricular activities such as seminars, workshops or organizing hackathons.

Based on this evidence, the research developed has been guided by the research question: To what extent does AI relate to the hobbies and digital competence of students and teachers? The general objective that arises from this research question is to analyze the relationship between AI, hobbies, and the digital competence of students and teachers.

Based on this general objective, the following specific objectives are proposed:

- To analyze the relationship between AI and the hobbies of students and teaching staff in response to the research question: To what extent are there differences between students and faculty in AI-related hobbies?
- To determine whether there are differences between students and teachers in terms of digital competence and/or use of AI resources in response to the research question: To what extent does the use of AI and other digital competencies differ between teachers and students?
- To determine whether there are gender differences with regard to digital competence and/or use of AI resources in response to the research question: To what extent do digital competencies—such as AI use—depend on gender?
- To determine whether there are differences according to educational level in the level of digital competence and/or use of AI resources in response to the research question: To what extent do digital competencies—such as AI use—depend on educational level?
- To determine whether there are school-based differences related to digital competence and/or use of AI resources in response to the research question: To what extent do digital competencies—such as AI use—differ between educational centres?

As an initial working hypothesis, it is proposed that there are differences between students and teachers in terms of AI-related hobbies, digital competence and the use of AI resources, with a higher percentage of affirmative responses from students. No gender

differences are anticipated, while individuals with higher educational levels are expected to demonstrate stronger digital competencies.

2. Metholology

2.1 Sample

The work sample is made up of 244 participants, 74 teachers and 170 students. Among the teaching staff, 70% are women, 28% are men and 2% prefer not to answer this question. 50% of the teachers teach in the Early Childhood Education degree, 5% in the Primary Education degree, 20% in the dual Early Childhood/Primary Education degree, and 25% in the Master's program for Secondary Education. As for their origin, 66% of the teachers are from Florida Universitària, 27% from the International University of Valencia (VIU) and 7% from the University of Lleida (UDL).

Among the student body, 71% are women, 27% are men, and 2% prefer not to answer. 16% are enrolled in the Early Childhood Education degree, 35% in the Primary Education degree, 18% in the dual Early Childhood/Primary Education degree, and 31% in the Master's program for Secondary Education. 87% of the students come from Florida Universitària, 4% from the International University of Valencia (VIU), and 9% from the University of Lleida (UDL).

2.2 Data acquisition and processing

To address the objectives of this research, a non-experimental design within the positivist paradigm was proposed, defining the variables to be measured based on two validated questionnaires that were adapted to the present study and carried out online depending on whether the sample was the teaching staff or the students. In relation to the questionnaire on the use of AI resources, the instrument developed within the framework of the Innovative Centers Project (DIM-EDU Educational Network) proposed by Marquès (n.d.) was used and adapted. Although this questionnaire was originally designed for early childhood and primary school teachers, adjustments were applied to this study so that the language and formulation of some items could be adapted to both teachers and university students without modifying the conceptual content. This adaptation was reviewed by two experts in educational innovation to ensure content validity.

The questionnaire used in the present investigation consists of the following dependent variables:

1. Relationship of hobbies with AI. It consists of 1 question to which the answer can be “Yes” or “No”. For the analysis, “Yes” is given a 1 and “No” a 0.

2. A self-diagnosis questionnaire of digital competencies defined by the Ministry for Digital Transformation and of the Civil Service within the Generation D Pact program (Ministry of Economic Affairs and Digital Transformation, n.d.). It consists of 21 questions based on the Model of the Digital Competences of Spanish Citizenship. The variables it measures are:

a. Information and data literacy (Question 1, 2, 3). Maximum score: 9.

b. Communication and collaboration (Question 4, 5, 6, 7, 8, 9). Maximum score: 18.

c. Digital content creation (Question 10, 11, 12, 13). Maximum score: 12.

d. Security (Question 14, 15, 16, 17). Maximum score: 12.

e. Problem-solving (Question 18, 19, 20, 21). Maximum score: 12.

For each question, there are three statements about digital practices. Each of the statements must be answered by marking the option “Yes” or “No”. For the analysis, “Yes” is given a 1 and “No” a 0. The higher the score, the higher the competence in each area.

In the present study, all the variables of the questionnaire, as well as all the associated questions, have been taken into account.

3. Questionnaire on the use of AI Resources in teaching and learning processes, designed within the Innovative Centers Project (DIM-EDU Educational Network) (Marquès, n.d.). The original questionnaire is addressed to teachers and measures the following variables:

a. Training received on AI and its appropriate use for teaching and learning.

b. Use of AI resources.

c. Student's use of AI resources.

d. Advantages that arise when integrating these AI Resources.

e. Problems that are associated with the integration of these AI Resources.

f. Adaptations that have been made in the center when integrating the use of the AI Resources.

For each section, different statements about the use of AI are presented. Each statement must be answered by marking the “Yes” or “No” option. For the analysis, “Yes” is given a 1 and “No” a 0. The present work has taken these three areas into account:

a. Use of AI resources (7 statements, maximum score 7)

b. Advantages and problems observed when integrating these AI resources (5 statements, maximum score 5)

c. Use of AI resources in the classroom (3 statements, maximum score 3)

The dependent variables in this study therefore are:

1. The relationship between hobbies and AI

2. Digital competence. Subvariables:

a. Information and data literacy

b. Communication and collaboration

c. Digital content creation

d. Security

e. Problem-solving

3. Use of AI resources in the teaching-learning process. Subvariables:

a. Use of AI resources

b. Advantages and problems observed when integrating these AI resources

c. Use of AI resources in the classroom

The independent variables of the study are as follows:

1. Sample: two established groups:

1. Teachers

2. Students

2. Gender: three established groups:

0. Male

1. Female

2. Prefer not to answer.

3. Educational level: four established groups:

0. Early Childhood Education

1. Primary Education

2. Dual Early Childhood/Primary education

3. Master's in Secondary Teaching

4. Center: three established groups:

0. Florida Universitària

1. International University of Valencia (VIU)

2. University of Lleida (UDL).

The data collection process was carried out during the first quarter of the 2023-2024 academic year. At campus-based universities, one teacher was selected from each degree program to facilitate access to the questionnaire during face-to-face classes. In the case of the online university, the questionnaire was conducted live during a synchronous session by the teaching staff. Participation was voluntary and anonymous, and all participants were informed about the objectives of the study and the intended use of the data, thereby ensuring informed consent.

2.3. Statistical analysis

To analytically verify the normal distribution of the data, the Kolmogorov-Smirnov test and the Shapiro-Wilk test were used. In all numerical results showing a statistical analysis of the data, statistical significance was obtained using the non-parametric Mann-Whitney U test (for 2 samples) and the Kruskal-Wallis test (for k-samples) with a two-tailed significance level in order to analyze whether there are differences in the values of the dependent (quantitative) variables between the groups defined by the independent (categorical) variables. Values with a p-value less than or equal to 0.1, corresponding to a 90% confidence interval, were considered significant. Statistical analyses were performed using the statistical analysis program SPSS (Statistical Package for Social Sciences, version 24).

2.4. Ethical considerations

To analytically verify the normal distribution of the data, the Kolmogorov-Smirnov test and the Shapiro-Wilk test were used. In all numerical results showing a statistical analysis of the data, statistical significance was obtained using the non-parametric Mann-Whitney U test (for 2 samples) and the Kruskal-Wallis test (for k samples) with a two-tailed significance level in order to analyze whether there are differences in the values of the dependent (quantitative) variables between the groups defined by the independent (categorical) variables. Values with a p-value less than or equal to 0.1, corresponding to a 90% confidence interval, were considered significant. Statistical analyses were performed using the statistical analysis program SPSS (Statistical Package for the Social Sciences, version 24).

3. Analysis and results

Initially, to determine whether the behavior of the dependent variables (and subvariables) was normal or not, Kolmogorov-Smirnov and Shapiro-Wilk normality tests were performed.

In both tests, the coefficient is $p < .05$, so the null hypothesis is not accepted, and the sample does not behave normally (Table 2).

Table 2

Normality tests on dependent variable data

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	p	Statistic	df	p
1. The relationship between hobbies and AI	0.524	244	0.000	0.377	244	0.000
2. Digital competency	0.067	244	0.009	0.983	244	0.005
2.1. Information and data literacy	0.125	244	0.000	0.944	244	0.000
2.2. Communication and collaboration	0.097	244	0.000	0.958	244	0.000
2.3. Digital content creation	0.122	244	0.000	0.968	244	0.000
2.4 Security	0.182	244	0.000	0.917	244	0.000
2.5. Problem-solving	0.117	244	0.000	0.946	244	0.000
3. Use of AI resources in the teaching-learning process	0.114	244	0.000	0.943	244	0.000
3.1 Use of AI RESOURCES	0.116	244	0.000	0.933	244	0.000

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	p	Statistic	df	p
3.2. Advantages and problems encountered when integrating AI RESOURCES	0.233	244	0.000	0.813	244	0.000
3.3 Use of AI resources in the classroom	0.240	244	0.000	0.795	244	0.000

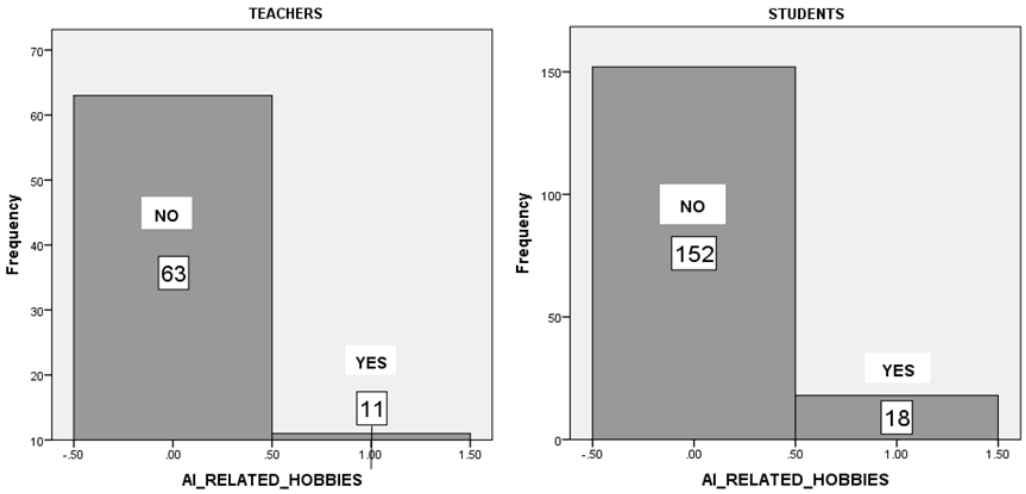
Note. Df =Degrees of freedom, p =Signification or p-value.

Based on the normality results, the non-parametric Mann-Whitney U test (2 samples) and Kruskal-Wallis test (k-samples) were used.

In response to the question, “Are there differences between students and teachers in terms of AI-related hobbies?”, no significant differences were observed between teachers and students in terms of AI-related hobbies. In fact, hobbies unrelated to AI, such as sports, drawing, reading, and traveling, prevail in both groups (Figure 1).

Figure 1

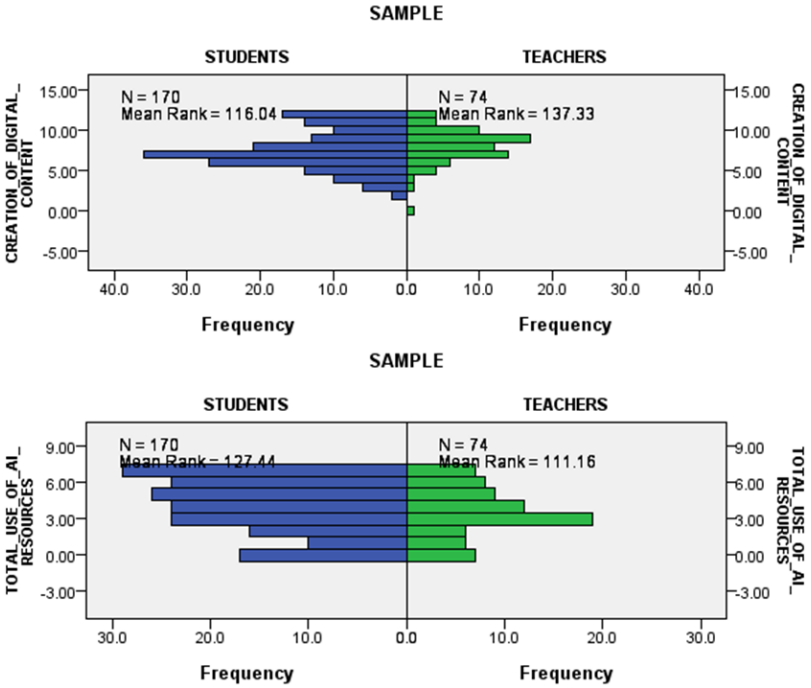
Histograms of AI-related hobbies among students and teachers



In relation to the research question, “Do digital competencies such as the use of AI differ between teachers and students?” (objective 2), the results show that there are no significant differences in the dependent variables (the level of digital competence and the use of AI resources between students and teachers). In terms of the subvariables, significant differences (p-value = .029) were observed between the two groups in the creation of digital content, with a higher level of creation among teachers and in the use of AI resources (p-value = .095), with higher use among students (Figure 2).

Figure 2

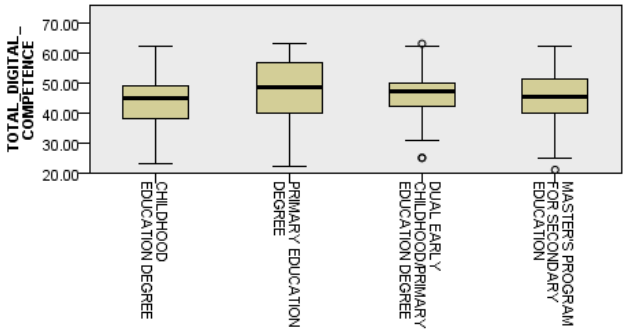
Mann-Whitney U test for dependent variables (1) "digital content creation" (2) "use of AI resources" based on the sample (teachers/students)



Regarding the next research question, "Do digital competencies such as the use of AI depend on educational level?" (objective 4), significant differences were identified with regard to the overall level of digital competence (p-value = .069), which was higher in primary education (Figure 3). Within the subvariables that define digital competence, considerable differences were observed in: Information and data literacy (p-value = .07), Digital content creation (p-value = .044), Security (p-value = .085), Problem-solving (p-value = .009). In all cases, the level of competence was higher in primary education. No differences were observed according to educational level in the dependent variables: AI-related hobbies and use of AI resources.

Figura 3

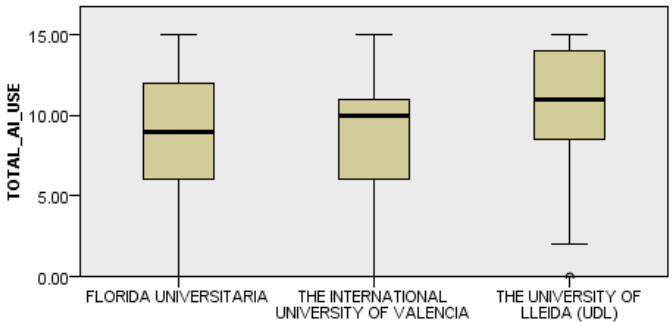
Kruskal-Wallis test for the dependent variable "level of digital competence" according to educational level (Early childhood Education, Primary Education, Dual Early Childhood/Primary Education, Master's in Secondary Teaching)



On the other hand, the question as to whether digital competencies such as the use of AI differ between educational institutions (objective 5) is raised. Significant differences were observed in the use of AI resources (p-value = 0.077), with greater use at the University of Lleida (UDL) (Figure 4). Within the subvariables, it was observed that teachers at the University of Lleida make greater use of AI resources (p-value = 0.023) and have better digital problem-solving skills (p-value = 0.076). In addition, the University of Lleida and the International University of Valencia show greater competence in digital content creation (p-value = 0.016).

Figura 4

Kruskal-Wallis test for the dependent variable "use of AI resources" according to the center (Florida Universitària, the International University of Valencia, the University of Lleida)



Regarding the last research question, "Do digital comptencies such as the use of AI depend on gender?" (objective 3), no significant differences were observed in any variable or subvariable.

4. Discussion

The results obtained facilitate a more in-depth analysis of the links between AI, personal hobbies, and digital competence within higher education contexts. Some of the most notable findings in relation to the theoretical framework developed above are discussed below.

Firstly, no significant differences were observed between teachers and students in terms of hobbies related to AI, with an even higher prevalence of hobbies unrelated to AI. This indicates that those surveyed still exhibit reluctance to use technology during their leisure time. Therefore, in line with Spirina (2018) and Flores-Vivar and García-Peñalvo (2023), AI and its use should be incorporated into school and university curricula. Thus, these authors propose options such as working with AI in extracurricular activities such as seminars, workshops, or hackathons. In this way, we would see an increase in the use of AI in our daily lives in the long term, both in leisure and professional settings. This low level of engagement could be related to several factors, such as the perception of AI as a strictly academic or professional tool, the lack of cultural references that integrate technology into leisure, or even a certain generational resistance to the use of these tools outside the workplace. The limited integration of AI in informal settings could be hindering its critical appropriation by students and teachers, which has important implications for the development of comprehensive digital competencies. Therefore, promoting AI-mediated

recreational or leisure experiences could be key to increasing familiarity with and acceptance of this technology in all areas of life.

Secondly, there is evidence of a differentiated use of AI according to academic role: while students use AI tools more frequently to support their learning processes, teachers make greater use of these tools for content creation. This result is consistent with the approach of the DigCompEdu Framework (Redecker, 2020), which emphasizes the need for teachers to integrate AI to enrich their teaching practices. It is also in line with the contributions of Bonilla et al. (2024), who highlight the potential of generative AI to improve the planning and development of adaptive and innovative educational materials. Furthermore, as pointed out by Chiappe, San Miguel, and Sáez (2025), the emergence of generative AI raises questions about the traditional role of teachers and the need to redefine their function in the educational process, as this technology could complement and significantly transform teaching practices. This differentiated use can be explained, in part, by the different purposes for which students and teachers approach AI: while students use it to efficiently complete specific tasks, teachers adopt a more technical and creative approach, incorporating AI into lesson planning. This reflects a possible functional gap in the use of technology, which could be addressed with specific training tailored to the needs of each group. In this case, if a more cross-functional and shared use of AI is not promoted between teachers and students, there is a risk of reproducing a pedagogical model in which teachers continue to assume a centralizing role, rather than facilitating more distributed and collaborative learning.

Thirdly, in terms of overall AI competence, significant differences can be observed, with primary education showing the highest percentage in information and data literacy, digital content creation, security, and problem-solving. As pointed out by UNESCO (2021), school systems must ensure that students are adequately prepared to function in a world where AI has arrived to transform our ways of life. Therefore, students and teachers must reflect on the responsible and ethical use of AI, increasingly incorporating strategies into their daily lives that allow them to observe all the possibilities it offers, such as expanding access to a wide variety of knowledge, facilitating the execution of operational tasks in various fields, and even increasing efficiency in different professions (Vera-Rubio et al., 2023; Selwyn et al., 2022; Zárate, 2021). Although the prospects are encouraging, they entail important ethical and deontological considerations that necessitate appropriate legislative regulation. It is important to recognize that, within the current pedagogical paradigm, students occupy a central role in the learning process. In this context, tools such as AI can facilitate greater emphasis on project-based learning, flexible learning, collaborative learning, and self-regulated learning, thereby enhancing the overall quality of education and contributing to the advancement of educational systems (Flores-Vivar & García-Peñalvo, 2023). In this sense, the incorporation of AI as an educational resource during initial teacher training may be key to developing these skills (Ayuso del Puerto & Gutiérrez, 2022). Initial teacher training programs should review and update their training strategies to ensure equitable technological literacy across different educational stages. These results also emphasize the need to adapt practice and assessment environments to ensure that digital competence is not only developed but also consolidated and integrated into professional practice.

Finally, other interesting results from this study are linked to the lack of gender differentiation in the results for the different variables analyzed. Thus, it can be observed that the greatest differentiation lies in the lack of training in this area and the lack of awareness of many of the possibilities that AI offers in educational environments. This may

explain why some educational environments and/or settings are more conducive than others to its use, given that the University of Lleida (UDL) is the institution that uses AI the most according to the sample in this study. In addition, both the University of Lleida and the International University of Valencia show greater competence in the creation of digital content. In this case, both are university settings; therefore, as highlighted in the recent report by Pedreño et al. (2024), the role of AI in this sphere is pivotal for the renewal and transformation of universities. Nevertheless, within the European context, the outcomes related to the integration of AI in these environments, the training of teaching staff regarding the opportunities it presents in the classroom, as well as the development of policies governing its appropriate use, remain comparatively limited. The absence of gender differences could be interpreted as a positive sign of democratization of access to digital competencies ; however, it may also be masking more subtle inequalities linked to the type of training received, perceived self-efficacy, or access to practical experience with AI. As for the differences between schools, these could be related to institutional factors, such as strategic commitment to innovation, the existence of clear digitization policies, or the presence of pedagogical leaders who promote the use of AI. This implies that the institutional context plays a key role in technology adoption, reinforcing the need to implement consistent and sustainable policies that ensure adequate training at all levels and in all regions.

5. Conclusions

The findings of this study underscore the growing importance of artificial intelligence (AI) in education, as well as the need to continue exploring its impact on the digital competence of teachers and students. Although no significant differences were identified in AI-related hobbies between the two groups, the results reflect greater use of AI tools by students and greater use for content creation by teachers. It was also observed that digital competence varies according to educational level, with primary education standing out as the group with the highest levels of information literacy, digital content creation, security, and problem-solving.

On a practical level, the results of this research not only provide empirical knowledge about the use and perception of AI in the university context, but also offer a solid basis for pedagogical and institutional decision-making. First, they help guide the design of digital competence and AI training programs tailored to the different needs of teachers and students. The results can also be used to select the most appropriate AI tools based on user profiles (content creation, automation, or learning personalization).

The data obtained in the study underscore the importance of continuous training and the development of pedagogical strategies that integrate AI in an ethical and effective manner. Furthermore, the difference in the use of AI among educational institutions suggests the need for uniform policies that promote equity in the implementation of these technologies. In this sense, this study provides empirical evidence on the interrelationship between AI and education, providing a starting point for future research that delves deeper into the challenges and opportunities posed by its incorporation into a higher education context.

5.1. Limitations and future lines of research

This study presents certain limitations that warrant consideration. In particular, the exclusive use of quantitative methods constrains our understanding of individual motivations and perceptions; therefore, future research should incorporate qualitative approaches. Also, setting significance at $p \leq 0.1$ reflects the exploratory nature of the work, but suggests the need to replicate these analyses with more rigorous statistical criteria. Finally, although the originality of the approach is noteworthy, it would be useful to explore how these results fit into existing conceptual frameworks on digital competence and technology adoption in greater depth, thereby enabling a more theoretical and contextualized contribution to the field.

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