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Level of performance of university professors on the use of AI

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INNOVATIVE AND MEANINGFUL KNOWLEDGE: TOWARDS A SUSTAINABLE BUSINESS
ACIEK PARIS 2024, June 4-6

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- Literature review
- Materials and Methods
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- Conclusions, limitations and further research

Introduction

- The impact of AI in higher education is one of the most significant areas where this technology is creating both challenges and opportunities.
- Universities need to take strategic action to adapt to new realities at different levels:
- This is a vibrant field of knowledge, which affects human capital development and thus our societies and countries' future social and economic development.

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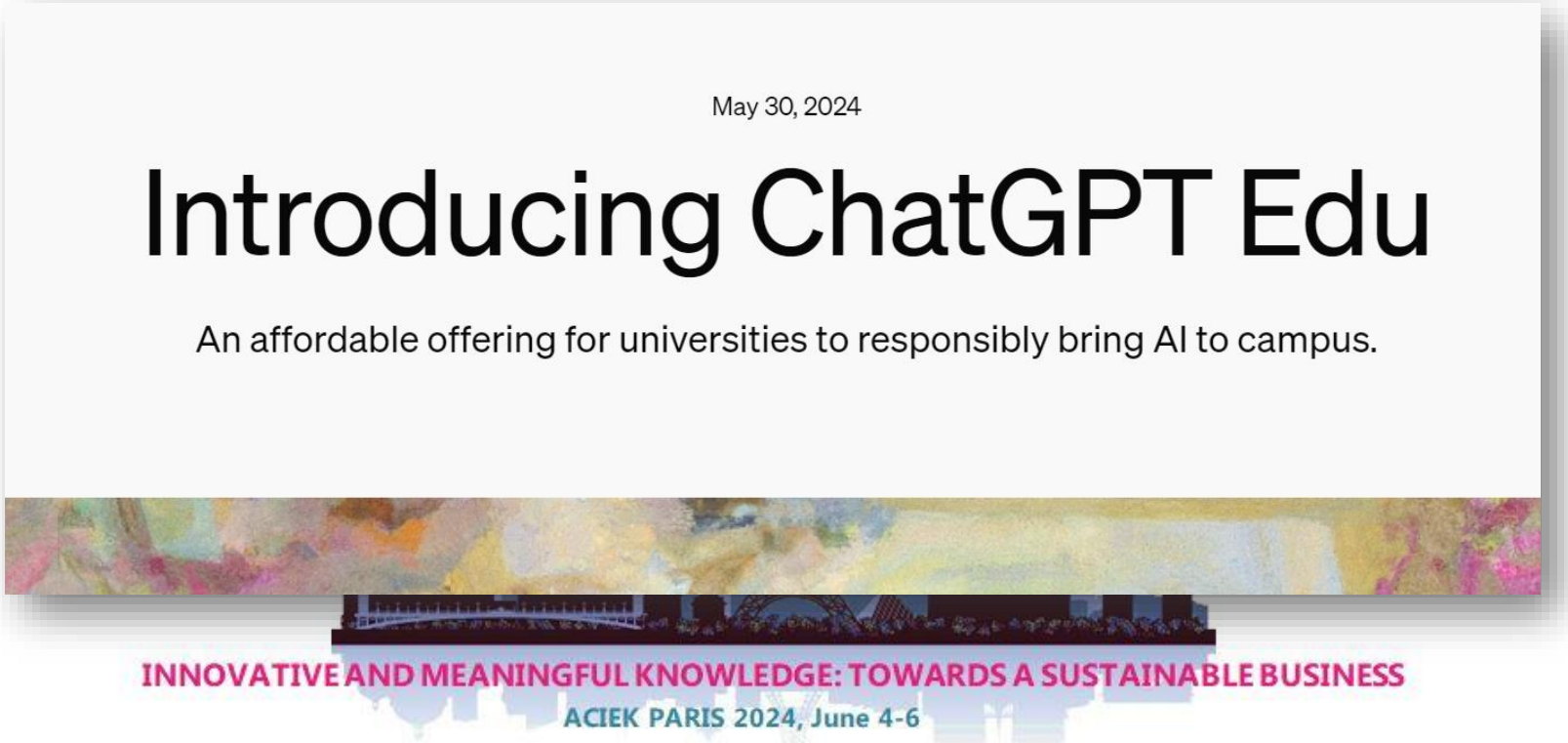
Introduction

- OpenIA reached 180.5 M users (August 2023) and 1,8 Billions visitors Feb 2024 (source OpenAI)
- The majority (60.97%) of OpenAI's site visitors are aged between 18 and 34, and they are 54.11% male and 45.89% female (source OpenAI)



Aims and scope

We have been conducting a series of studies since 2021 on the impact of digital competence in higher education in the field of ***Economics of Education.***

We have already studied the evolution of the **digital competence** of university educators before and after Covid (2022); the relationships of educators´ implementation of technology (2022) with student´ digital competence (2023), students´ perceptions of learning and students' outcomes (2024).

NÚÑEZ-CANAL, M.; DE OBESSO, M.; & PÉREZ-RIVERO, C. (2024) Does educators' digital competence improve entrepreneurial students' learning outcomes? Journal: International Entrepreneurship and Management (Aceptado, pendiente de publicación) DOI: 10.1007/s11365-023-00921-x

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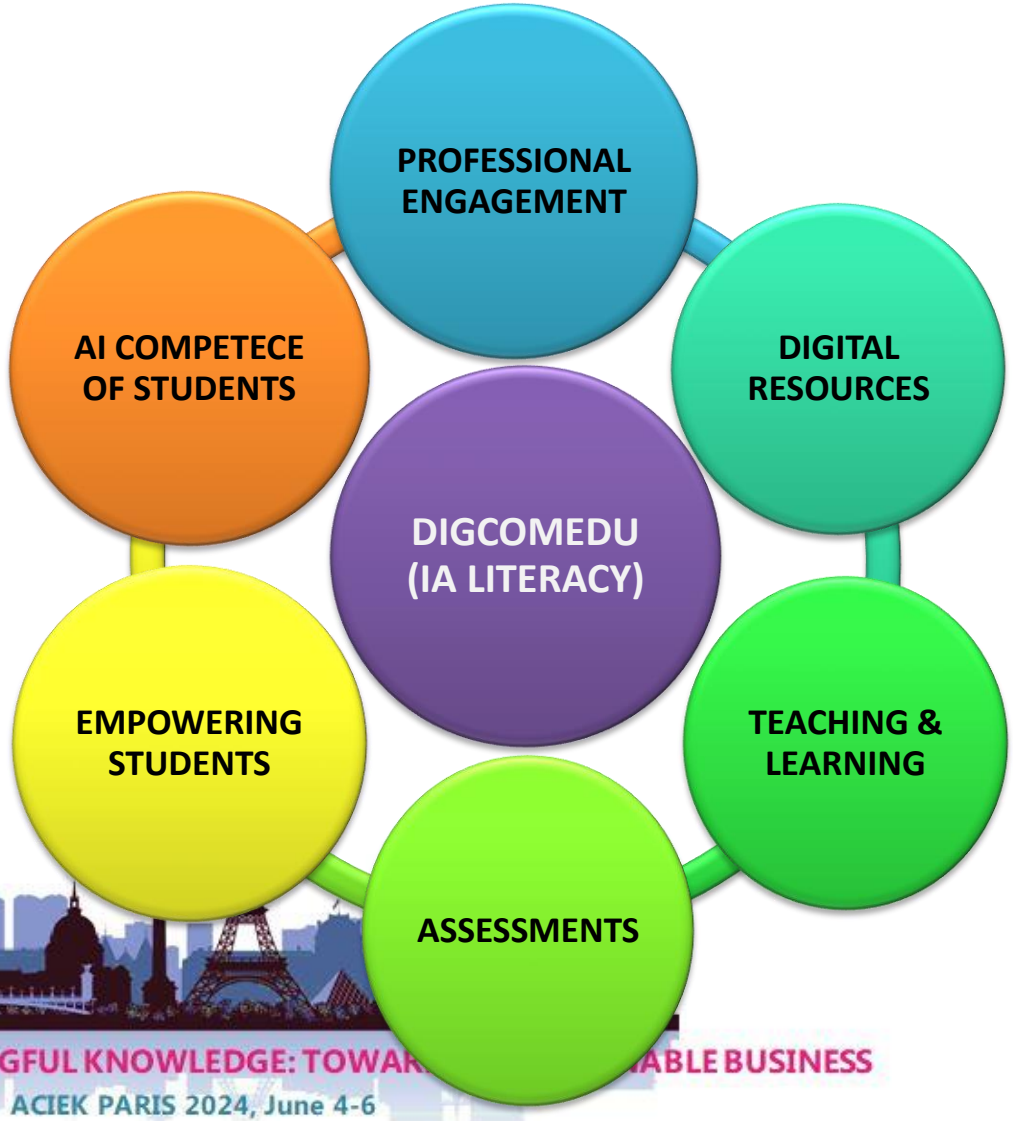
In this case, the increasing importance of AI has led us to address a new study to measure the level of performance of professors in using AI and searching for relationship

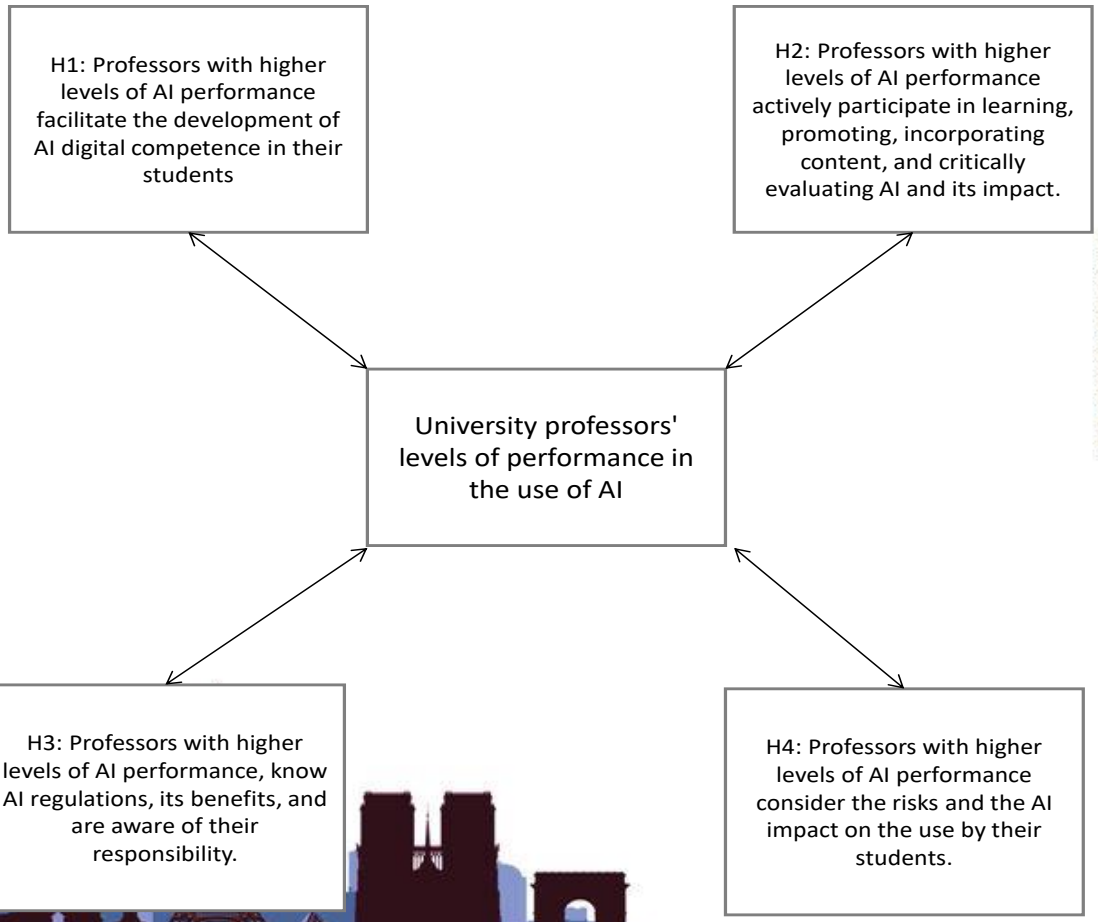
Evolution of Digital Competence to AI competence

Reformulated DIGCOMEDU to AI Literacy based on DigCom 2.2. (EU, 2022) and the conceptualization made by Ng et al. (2023) published in *Educational Technology Research and Development*



Research Question and Hypotheses formulation

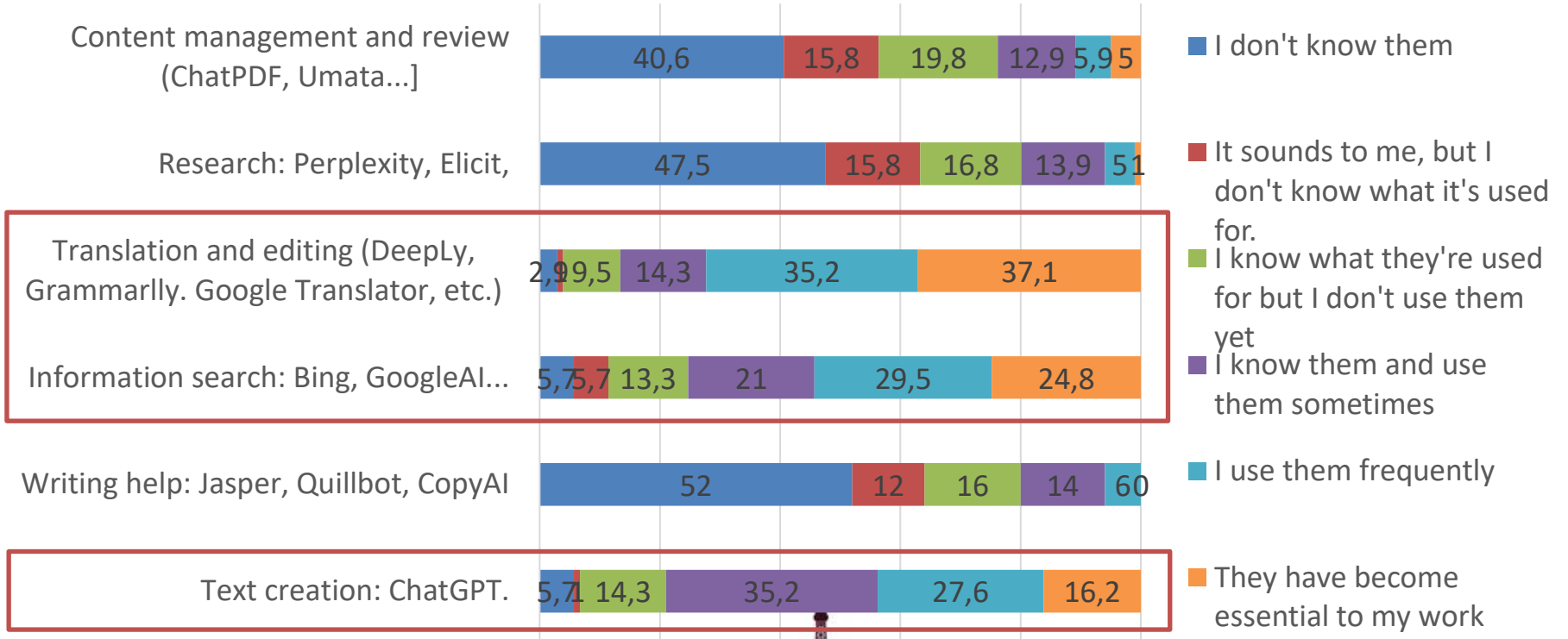
Following a review of the state of the art and literature in AI in Higher Education and searching for causal relationship between AI level of professors performance in the use of AI and its impact on student learning outputs, we have formulated the following hypotheses:



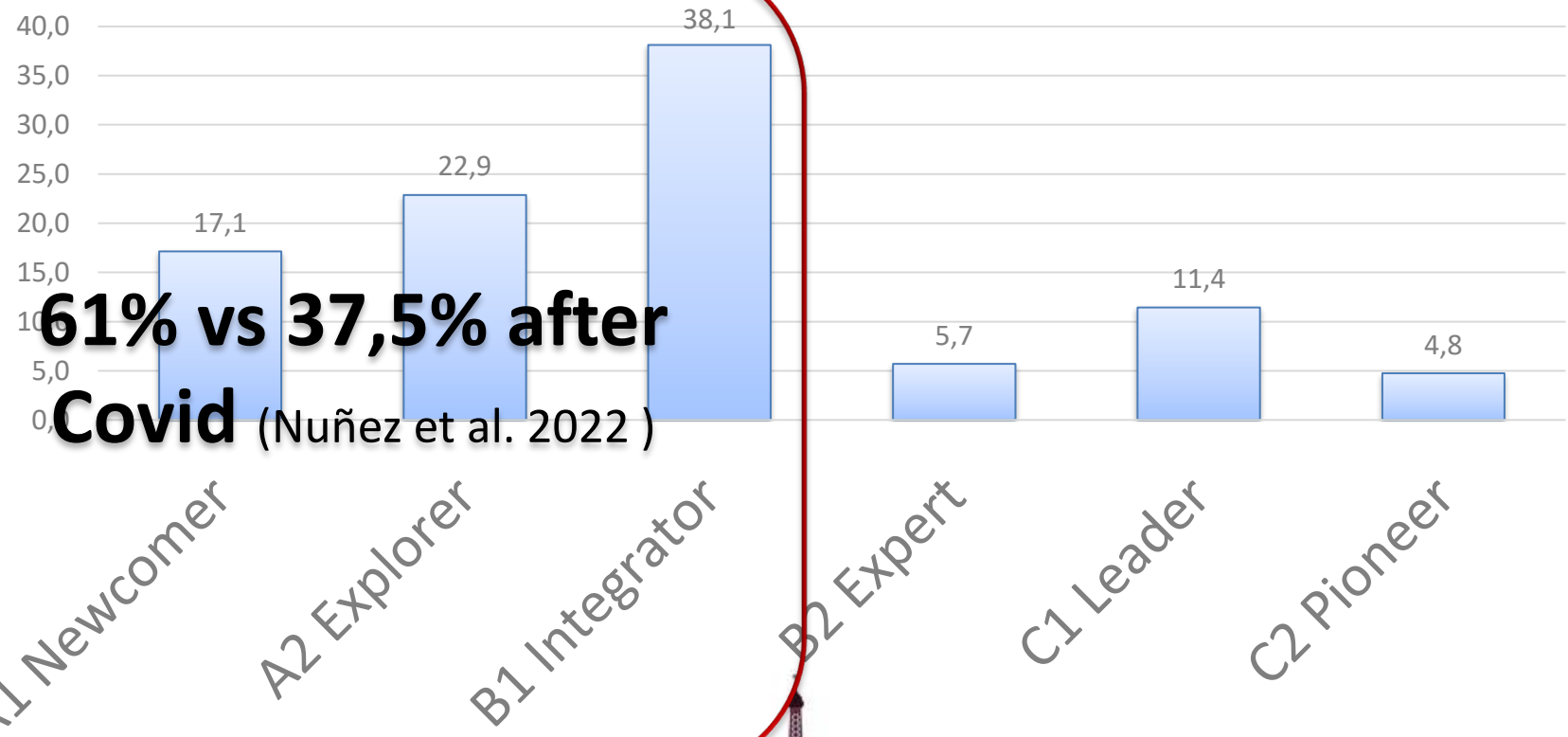
Materials and Methods

- An adapted version of the questionnaire of DIgComEdu was conducted during November and December 2023
- Dependent variable was "*How do you evaluate your performance in the use of artificial intelligence (AI)*? With 6 levels of proficiency explained
- Anonymous 105 responses of professors from universities (economics & business studies) in Spain using the snowball technique to ensure a representative sample. Compliance with ethical standards is ensured in gathering the data of the different universities.
- Different years of teaching experience, categories, fields of knowledge, gender: 63% males and 37% female

Results: Knowledge and use of AI Tools

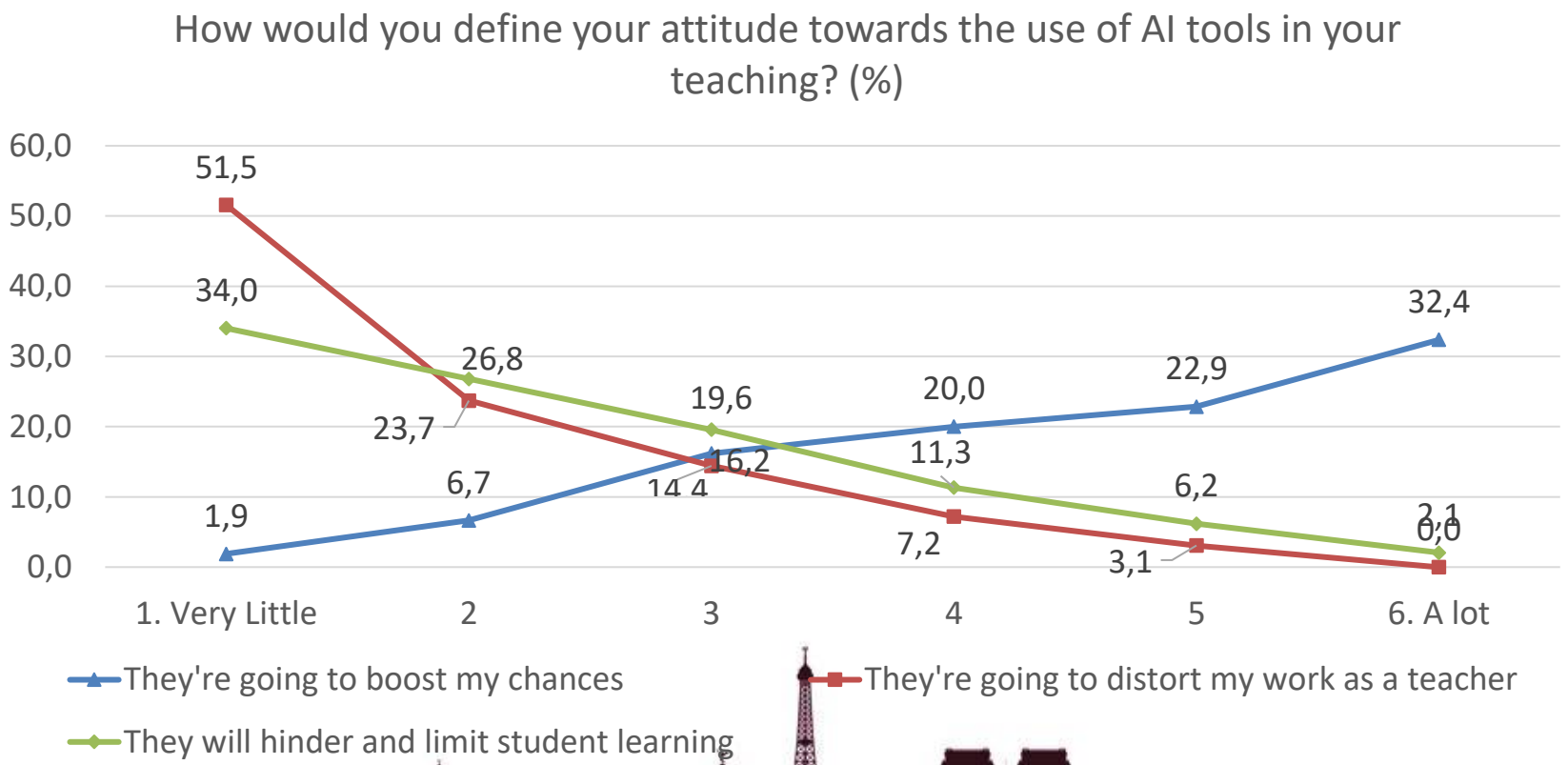


Results: level of performance

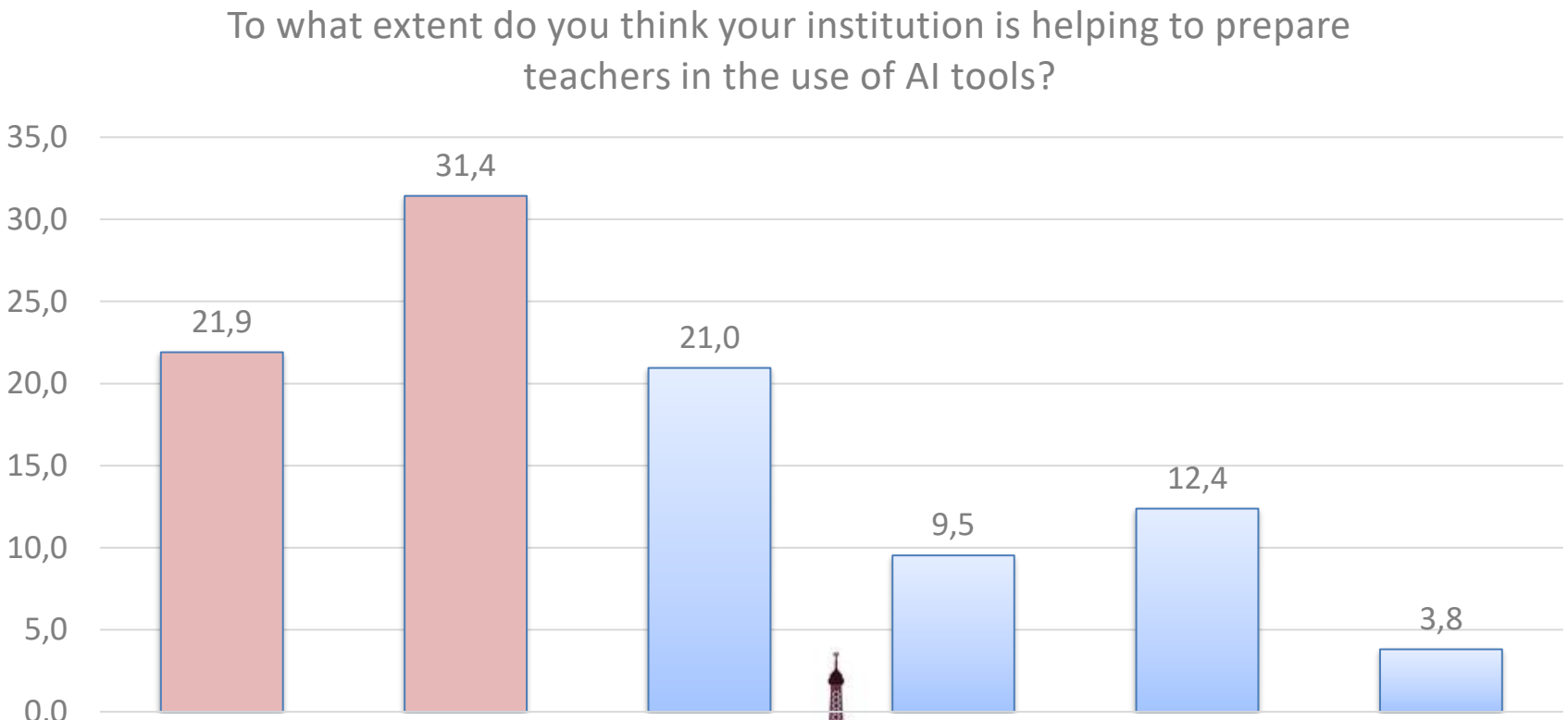


61% vs 37,5% after Covid (Nuñez et al. 2022)

Results: attitude towards the use of AI tools



Results: Institution attention to AI tools



Factor análisis: 22 items of the 6 áreas of DigComEdu adapted to AI competence

- Reliability: Cronbach´s Alpha = 0,977
- SPSS used (KMO) sample adequacy value of 0.935.
- Barlett's sphericity test was significant (0.000)
- According to the factor analysis, the model's variables can be classified into **four groups** (73.25% variance) conceptualized as follows:

  - ***Factor 1: Teaching and learning by applying AI to feedback, assessment, and pedagogy and facilitating its use among learners.***
  - ***Factor 2: Attitude toward the use of AI, data governance, and ethical use.***
  - ***Factor 3: Knowledge of the guidelines and regulatory framework for AI***
  - ***Factor 4: Protecting students from the impact of AI and its risks***

REGRESSION MODEL

- The dependent variable of the model: *How do you evaluate your performance in the use of artificial intelligence (AI) Assign a proficiency level from A1 to C2, where A1 is the lowest and C2 is the highest.*
- For the confirmation of the hypotheses ANOVA was made with the following result F will be done jointly for the factors obtained from the factor analysis.

- Anova

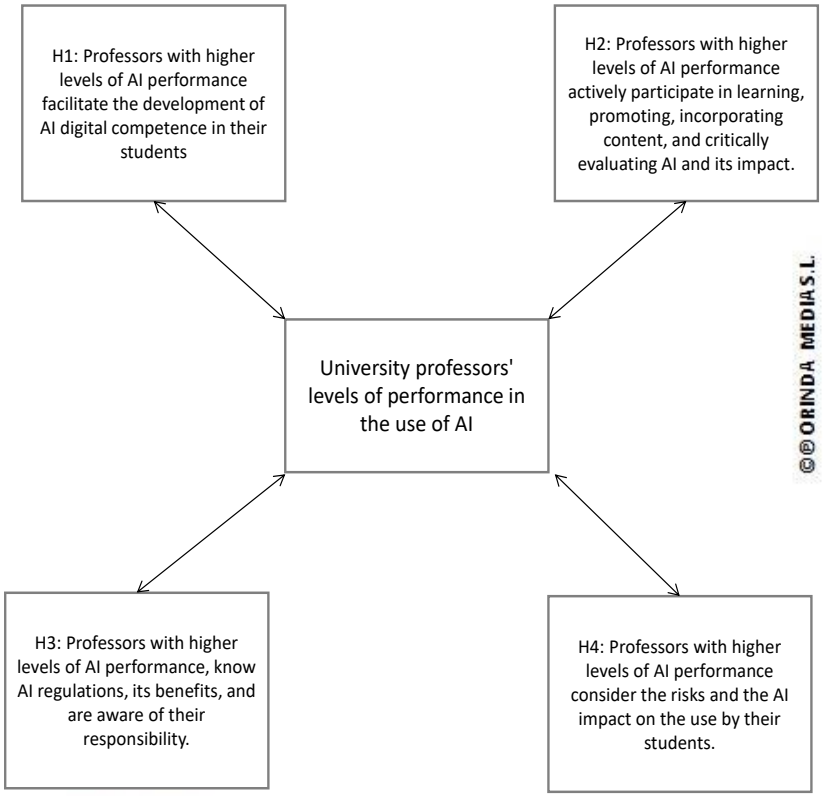
Model		Sum of squares	gl	Mean Square	F	Sig.
1	Regression	115,977	4	28,994	37,713	,000[b]
	Residue	76,881	100	0,769		
	Total	192,857	104			

to. Dependent variable: How is the use of artificial intelligence (AI) evaluated today? Assign a proficiency level from A1 to C2, with A1 being the lowest and C2 being the highest.
b. Predictores: (Constante), REGR factor score 4 for analysis 1, REGR factor score 3 for analysis 1, REGR factor score 2 for analysis 1, REGR factor score 1 for analysis 1

Hypotheses confirmation

Model		Unstandardized coefficients B	Unstandardized coefficients Stándar Error	Standardized coefficients Beta	t	Sig.
1	(Constant)	2,857	0,086		33,390	0,000
	Factor 1: Teaching and learning by applying AI to feedback, assessment, and pedagogy and facilitating its use among learners.	0,679	0,086	0,499	7,899	0,000
	Factor 2: Attitude toward the use of AI, data governance, and ethical use.	0,745	0,086	0,547	8,670	0,000
	Factor 3: Knowledge of the guidelines and regulatory framework for AI	0,230	0,086	0,169	2,672	0,009
	Factor 4: Protecting students from the impact of AI and its risks	0,213	0,086	0,157	2,480	0,015

to. Dependent variable: How is the use of artificial intelligence (AI) evaluated today? Assign a proficiency level from A1 to C2, with A1 being the lowest and C2 being the highest.



In the causal analysis, all the hypotheses developed are fulfilled.

Discussion

- An adaptation of the frameworks is required
- We can confirm the great impact of technology on professors' teaching in higher education since the pandemic, as demonstrated in all research findings. Digital competence is now an essential part of teaching skills at the university level
- We can observe that there is a considerable gap and dispersed use in AI performance and concerns among educators.
- We can conclude that higher performance on AI is significantly linked with a better knowledge of the regulatory framework and more concern about the impact on students' learning and on potential risks and ethical issues.
- This study highlights the need for continuous and tailored AI training for educators, emphasizing the importance of integrating these tools effectively and ethically into the curriculum design and assessment methods.
- Educational institutions (universities) and policymakers must **recognize this need and provide resources for effective and ongoing training of educators**.

Future of AI in Higher Education

- AI is affecting problems with the lack of human agency (Aler Tubella et al., 2024) such as the impact on student noncognitive skills (Wang et al., 2023). AI could affect behavioral aspects at motivational levels such as:
  - Academic integrity and the risks of plagiarism and automation in students' assignments are major ethical concerns
  - Lack of critical thinking, lack of effortful thinking, and incentive to learn passivity
  - Overreliance on AI affecting teaching authority and knowledge convey

- Professors must embrace new technologies and adapt their teaching methods to promote as main learning outcome of **critical thinking** in all knowledge areas.

- The need for **guidelines, principles, and frameworks for the responsible and ethical use** of AI in higher education. (Bond and Khosravi, 2023)

- The potentiality of AI in education if **University management defines clear strategies** including all stakeholders and allocates resources to ensure efficacy and outcomes.

- As a **limitation of this study**, broader data are needed to confirm conclusions as well as longitudinal studies to prove the efficiency of policies and solutions.

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