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Análise Exploratória Transversal da Adoção de IA no Ensino Superior: Quadros Regulamentares, Influências Culturais e Aplicações Práticas no Instituto Politécnico de Coimbra

Rodrigo Pereira

ISCAC | 2025

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The present thesis was submitted to the Higher Institute of Accounting and Administration of Coimbra to fulfil the requirements necessary to obtain a Master's degree in Management Information Systems. The thesis was carried out under the supervision of Professor Verónica Vasconcelos and the co-supervision of Professor Isabel Pedrosa and Professor Diana Koroleva.

Coimbra, October 2025

TERMS OF RESPONSIBILITY

I hereby declare that I am the author of this dissertation, which is an original and unpublished work that has never been submitted to another higher education institution for the purpose of obtaining an academic degree or other qualification. It is hereby asserted that all citations have been correctly identified, and that the author is cognisant of the grave ethical infractions associated with plagiarism, which may result in the annulment of this dissertation.

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Reaching the end of this thesis represents not only an academic milestone, but also a very personal victory. It was undoubtedly one of the most demanding challenges of my life, and it was only achieved thanks to the fundamental support of several people. It is therefore with immense gratitude that I address these words to all those who accompanied me.

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To Beatriz, my girlfriend, for your enormous affection, your gestures of love, and for always making me believe that I was capable.

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ABSTRACT

Over the past two years, following the launch of ChatGPT, artificial intelligence (AI) has become a central topic of debate in higher education, raising questions about how prepared teachers are to integrate these technologies into their teaching and administrative activities. This dissertation analyses how teaching staff and researchers at the Polytechnic University of Coimbra (IPC) perceive the adoption and use of AI in their daily tasks, as well as the main difficulties and concerns they associate with this integration. Using a questionnaire applied to IPC teachers from different scientific fields, the study assesses levels of self-efficacy in using AI, patterns of use across different tasks, and perceptions of institutional support, cultural factors, and regulatory frameworks .

The results reveal moderately positive levels of self-efficacy, but also significant heterogeneity between teachers, with generational asymmetries and differences in perceived institutional support. AI use is mainly concentrated in instrumental tasks, such as translation and writing support, while the adoption of AI for more advanced activities, including quantitative data analysis and AI-supported pedagogical decision-making, remains limited. The study also identifies considerable anxiety regarding discriminatory bias, data protection and the “black box” nature of AI systems, which is associated with a preference for clear and centralised regulatory frameworks, such as the European Union Artificial Intelligence Act (EU AI Act). By comparing the collected data with findings from other international partners involved in the transnational project, this work contributes to a broader and contextualised understanding of AI adoption in higher education. The dissertation offers practical insights for institutions seeking to promote informed, ethical and sustainable integration of AI, supporting teacher preparedness, regulatory alignment and the development of AI literacy in higher education.

Keywords: Artificial Intelligence, Higher Education, Technology Adoption, Organizational Culture, Transnational Analysis.

RESUMO

Nos últimos dois anos, após o lançamento do ChatGPT, a inteligência artificial (IA) tornou-se um tema central de debate no ensino superior, levantando questões sobre o grau de preparação dos professores para integrar essas tecnologias nas suas atividades letivas e administrativas. Esta dissertação analisa como o corpo docente e os investigadores do IPC percebem a adoção e o uso da IA nas suas tarefas diárias, bem como as principais dificuldades e preocupações que associam a essa integração. Utilizando um questionário aplicado a professores do IPC de diferentes áreas científicas, o estudo avalia os níveis de autoeficácia na utilização da IA, os padrões de utilização em diferentes tarefas e as perceções do apoio institucional, dos fatores culturais e dos quadros regulamentares.

Os resultados revelam níveis moderadamente positivos de autoeficácia, mas também uma heterogeneidade significativa entre os professores, com assimetrias geracionais e diferenças na perceção do apoio institucional. A utilização da IA concentra-se principalmente em tarefas instrumentais, como tradução e apoio à escrita, enquanto a adoção da IA para atividades mais avançadas, incluindo análise quantitativa de dados e tomada de decisões pedagógicas apoiadas pela IA, continua limitada. O estudo também identifica uma ansiedade considerável em relação ao preconceito discriminatório, à proteção de dados e à natureza de «caixa preta» dos sistemas de IA, o que está associado a uma preferência por quadros regulamentares claros e centralizados, como a EU AI Act. Ao comparar os dados recolhidos com as conclusões de outros parceiros internacionais envolvidos no projeto transnacional, este trabalho contribui para uma compreensão mais ampla e contextualizada da adoção da IA no ensino superior. A dissertação oferece insights práticos para instituições que procuram promover a integração informada, ética e sustentável da IA, apoiando a preparação dos professores, o alinhamento regulamentar e o desenvolvimento da literacia em IA no ensino superior.

Palavras-chave: Inteligência Artificial, Ensino Superior, Adoção de Tecnologia, Cultura Organizacional.

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List of abbreviations, acronyms, and initialisms

4E - Embrace, Enable, Experiment, Exploit

EU AI Act - Landmark, comprehensive law established by the European Union

GAVIP-IPC - Gabinete de Valorização Profissional e Inovação Pedagógica do Instituto Politécnico de Coimbra

GenAI - Generative AI

AI – Artificial Intelligence

IDEA - Inclusão, Diversidade, Equidade e Acessibilidade

IPC- Instituto Politécnico de Coimbra

LLM - Large Language Models

STEM - Science, Technology, Engineering and Mathematics

TRI 2.0 - Technology Readiness Index

UTAUT2 - Unified Theory of Acceptance and Use of Technology

1. Introduction

The evolution of Artificial Intelligence (AI) over the past few years has precipitated substantial changes across sectors, most notably in education. In this context, these changes represent a unique opportunity to improve administrative processes, create new learning experiences, and enhance pedagogical efficiency. However, the implementation of these new technologies is not without significant challenges, ranging from regulatory barriers and infrastructure limitations to resistance and/or denial on the part of teachers and higher education institutions themselves.

The efficient integration of AI into education is predicated on a comprehensive understanding of teacher preparation, the technical and ethical challenges involved, and the cultural factors that impact the acceptance and use of these technologies. In this context, it is necessary to analyse how cultural values and regulatory frameworks fit in with institutional perceptions and practices regarding AI. Hofstede's model, a theoretical framework utilised to study cultural divergences, facilitates understanding of how disparate societies adopt technological innovation (Hofstede 2001). It offers pertinent theoretical foundations with the capacity to exert a substantial influence on the implementation of artificial intelligence within higher education.

1.1 Objectives

This study seeks to understand how teaching staff and researchers at the Polytechnic University of Coimbra perceive the use of AI in their daily lives. The study focuses primarily on the Polytechnic University of Coimbra, thereby enabling a more detailed analysis of the local reality, in line with international research. Based on an exploration of regulatory and cultural factors, the aim is to assess the level of preparedness and interest of teaching staff in AI, identifying the main challenges and specific opportunities.

By contributing to an informed debate on the adoption of AI in higher education, this study focuses not only on expanding theoretical knowledge on the subject but also on providing practical information to facilitate the successful implementation of this

technology. Based on this analysis, it is hoped that the results will serve as a positive example for future initiatives to integrate AI into education, driving new, more effective and sustainable behaviours in academic settings.

General - This study aims to conduct a transnational exploratory analysis with international partners to study the adoption of AI in higher education. This research focuses on AI regulation in different countries and national cultural values in the adoption process.

Specific objectives: To assess the preparedness, willingness and interest of teachers in using AI in their teaching and administrative activities; to analyse the impact of cultural values on the adoption of AI, based on Hofstede's cultural dimensions; and to investigate how regulatory factors influence the integration of AI in higher education in Portugal,

Thus, we also aim to answer the following questions in order to make this analysis more specific:

- Is confidence in one's own knowledge to use AI positively correlated with a greater diversity of uses of the technology? That is, do teachers who feel more competent use AI for a broader range of tasks?

- Is there a negative relationship between years of teaching experience and the perception of having the necessary conditions (resources and knowledge) to use AI? That is, do *teachers with more years of service feel less prepared to integrate AI*?

- Do respondents who report higher levels of anxiety about the discriminatory bias of AI tend to prefer ethical principles to be defined at a macro level (legislative/by experts) rather than at a micro level (institutional/departmental)?

- To what extent does the scientific field (STEM vs Social Sciences/Humanities) influence the use of AI in quantitative data analysis in research?

- Do teachers who report greater use of Generative AI (GenAI) (and who are therefore potentially more exposed to and familiar with the technology) show less existential anxiety (about social risks and extinction) than those who use it less?

- Do teachers who are frequent users of Generative AI (and who therefore derive direct benefits from the technology) show less concern about lack of transparency (anxiety related to the "black box") than occasional users?

- Is there a significant correlation between Behavioural Intention (BI) to use AI and Existential Risk Anxiety? That is, are teachers who plan to use AI more the ones who are least concerned about its large-scale risks, or are these perceptions independent?

- Is Habit (HT), or lack thereof, a stronger predictor of actual Frequency of Use than BI itself?

1.2 Document Structure

This document is organised into four main chapters, which are supplemented by bibliographical references and appendices that support this research.

The first chapter introduces the study, outlining the general framework, highlighting the relevance of AI in higher education, the challenges associated with its adoption, and the objectives, including the research questions that guide the empirical analysis.

The second chapter, entitled Methodological Framework, describes the exploratory and mixed approach used, combining quantitative and qualitative methods. This section explains the protocol applied, the bibliographic research strategy, the criteria for selecting scientific articles, the procedures for collecting primary data, and the limitations arising from the sample size.

The third chapter, focusing on the theoretical framework, explains the main concepts and contributions of scientific literacy to AI, regulatory frameworks, factors influencing technology adoption, and ethical and operational implications.

The fourth chapter describes the empirical work, explaining the data collection instrument, the validation and dissemination procedures for the questionnaire, and the results obtained.

The fifth chapter, which concludes the research, summarises the main contributions of the research, taking into account the potential impact of AI on higher education and possible paths for its ethical, effective, and sustainable integration.

Finally, to complement the study, bibliographical references documenting the academic sources used are included, along with appendices containing the questionnaire and the disclosure letter.

2. Theoretical Framework

AI has emerged as one of the most transformative technologies of the 21st century, with a profound impact on higher education, redefining pedagogical, administrative, and research practices. The rise of large language models (LLMs), a type of AI aimed at understanding, generating and predicting text more naturally and humanly, such as ChatGPT, as well as the development of generative AI has catalysed an immense academic debate about its potential and challenges, highlighting its ability to personalise learning, automate processes and enrich the creation of educational content. In this context, the literature reviewed in this study reflects a consensus on the innovative and disruptive nature of AI, but also highlights the complexity of its adoption, influenced by ethical, cultural, structural, and regulatory factors. Globally, several authors have explored the practical applications of AI in various geographical contexts, from learning personalisation initiatives in Oman to the modernisation of education in Africa. At the same time, frameworks such as the EU AI Act seek to balance technological innovation with the protection of fundamental rights, equity and sustainability. This literature review analyses the role of AI in higher education, the regulatory frameworks that govern it and the factors that shape its adoption, with a particular focus on the opportunities and challenges facing the IPC. By systematising these perspectives, the aim is to establish a solid theoretical basis for understanding how AI can be integrated ethically and effectively in the academic context, contributing to pedagogical and administrative innovation without compromising the human values essential to the educational process.

2.1 Applied Protocol

The methodological protocol aims to ensure systematic and replicable research, following good practices in systematic literature review and primary data collection.

2.1.1 Research Strategy

The research strategy was carefully chosen to ensure a systematic and comprehensive approach. Initially, a systematic literature review was conducted following the PRISMA

2020 guidelines, an internationally recognised protocol that allows relevant studies to be identified, selected, and evaluated in a structured and transparent manner, with a specific focus on the adoption of AI in the context of higher education. At the same time, strict inclusion and exclusion criteria were established to ensure the quality and relevance of the selected materials, considering only scientific articles published between 2020 and 2025, written in English or Portuguese and submitted to peer review. To operationalise this research, the IEEE Xplore Digital Library and Scopus were used, employing strategic combinations of keywords, generating the following search expression:

"Artificial Intelligence" AND "Higher Education" AND "Regulatory Framework" AND "AI Adoption" AND "Universities" allowed the relevant results to be mapped efficiently.

2.1.2 Database Used

The selection of research sources was carefully carried out, favouring databases with academic recognition and credibility. Scopus stood out as the primary resource for the literature review, widely recognised by the scientific community for its thematic scope and rigorous indexing of publications. The IEEE Xplore Digital Library was also used. To refine the results obtained from the Scopus database, specific filters were applied, including:

- Time delimitation of publications between 2020 and 2025, thus ensuring the data is up to date;

- Selection by document type, considering scientific articles, literature reviews and conference papers;

- Restriction of the language to texts in English and Portuguese, ensuring accessibility and complete comprehension of the selected materials;

- Not including incomplete articles or those that, after reading the abstract, were found to be unrelated to the study;

This methodological approach allowed us to collect relevant, and up-to-date documents to support the research.

2.1.3 Selection Process

The selection process for scientific articles followed a rigorous methodology. In the initial phase of exploring the articles, applying the previously defined search phrase enabled us to identify 1,247 potential articles across the databases consulted. These initial results were subsequently refined by applying a relevance filter, yielding a more manageable preliminary list of 120 studies deemed relevant to the research.

In the next stage, called the Results Filter, a more detailed analysis of the pre-selected articles was carried out. At this stage, 47 studies were excluded because, although they addressed AI, they did not specifically address its use in educational contexts and therefore did not align with the research's central focus. In addition, 23 studies that did not meet the established quality criteria were eliminated because they were written in languages not covered by the inclusion criteria.

After this two-stage screening process, a final selection of 50 scientific articles was made that fully met all the criteria established for the research. This carefully selected final selection served as the documentary basis for the detailed, systematic analysis that supported the development of the study, ensuring the relevance and academic quality of the sources used.

Of these 50 results, 15 articles were selected, favouring those that presented greater analytical depth, methodological clarity and direct alignment with the central objectives of the research. This careful selection ensured the quality and relevance of the sources, while also ensuring the feasibility of in-depth analysis within the scope of this dissertation.

Figure 1 shows the process of exploring, screening, and selecting the publications, allowing us to observe it through to the final set of articles included in this research.

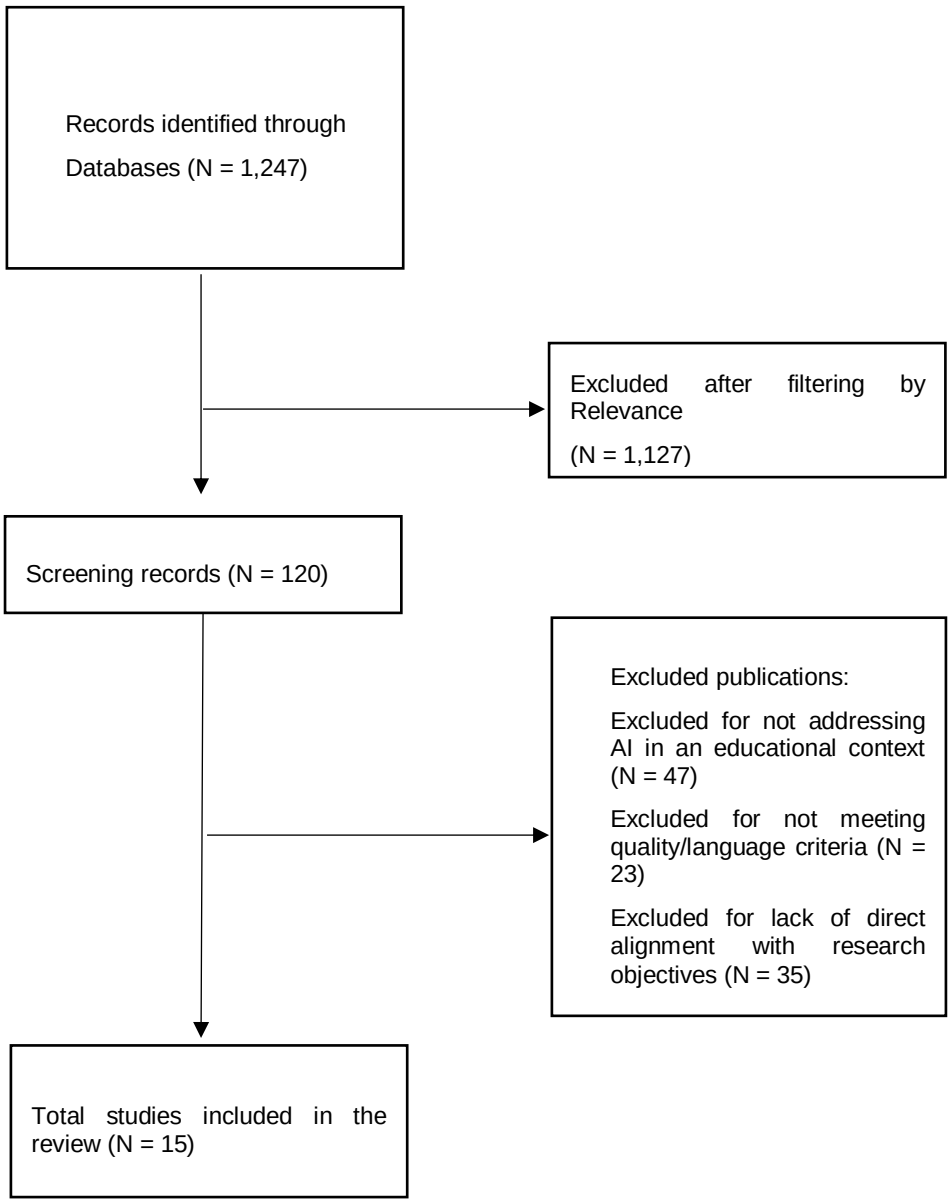

Figure 1: Flowchart of the Publication Selection Process

The comparison of the 1,247 articles identified in an initial phase of research with the established criteria resulted in the final selection of 15 articles, considered to add the most value to the topic under analysis and best suit the objectives defined for this investigation.

2.2 Artificial Intelligence

AI has emerged as a transformative technology capable of emulating human cognitive processes such as learning, reasoning, and self-correction (Galindo-Domínguez et al., 2024). This ability empowers computer systems or robotics to execute tasks in a manner analogous to or even surpassing human performance, encompassing domains such as observation, inference, communication, and decision-making (Ahmad et al., 2024). As such, AI is a broad concept that encompasses systems capable of performing functions traditionally associated with the human mind, such as problem-solving and learning (Korseberg & Elken, 2024).

In the domain of education, Generative AI (GenAI) has demonstrated considerable potential, presenting opportunities to enhance efficiency, creativity, and accessibility (Camacho-Zuñiga et al., 2024). For instance, the implementation of tools such as intelligent tutors, chatbots and automated assessment systems has been adopted to facilitate teaching, research and writing, thereby offering personalised learning experiences (Roy et al., 2022). Shailendra et al., (2024) emphasise that, despite its advantages, GenAI also poses challenges, including concerns about academic integrity, privacy, cognitive bias, and equitable access. As asserted by Capano et al., (2025), these concerns are shared, with the authors raising questions of transparency and accountability, especially in the context of higher education, due to the "black box" nature of AI.

The integration of AI into robust ecosystems is identified as an accelerator of social and economic development (Serpil & Kesim 2024). However, it should be noted that self-efficacy in the use of AI does not arise in isolation; it is influenced by factors such as AI literacy, interest in technology, attitudes towards it, and the effective use of its tools (Bewersdorff et al., 2025). This perspective is complemented by Huo & Siau (2024), who highlight GenAI's ability to generate content, ideas, and solutions from extensive data sets, transforming educational practices through intelligent co-creation and personalised learning.

In terms of practical applications, AI has been used to make predictions, recommendations and decisions that influence real or virtual environments (Watanabe, 2023). Furthermore, the integration of AI-based tools has enhanced the efficiency of administrative tasks, facilitating an inclusive and accessible educational environment that can adapt to diverse learning styles and the unique needs of individual students (Sokhibov & Azamjonov, 2024). On the other hand, Elbaz et al., (2024) focus on advances in autonomous text creation, a subject that is especially pertinent for the dissemination of knowledge and the automation of creative processes.

2.3 Regulatory Framework (EU AI Act)

The regulation of AI has been a subject of extensive debate within academic circles, with a particular emphasis on ethical, political and security aspects. The European Union, through the EU AI Act (*The EU Artificial Intelligence Act*, 2025), proposes a regulatory framework that aims to establish clear guidelines for the development and implementation of this technology, ensuring respect for fundamental rights and user privacy (Watanabe, 2023). This approach is corroborated by other authors, such as Elbaz et al., (2024) and Bewersdorff et al., (2025), who underscore the significance of ethical and political regulation to ensure that AI is employed in a responsible manner and in accordance with social values.

An examination of the literature indicates that transparency and accountability are considered central, inGalindo-Domínguez et al., (2024), they underline the need for safe, responsible and critical use of AI, emphasising transparency as a fundamental pillar. This viewpoint is further substantiated by the findings of Roy et al., (2022) and Espinoza Vidaurre et al., (2024), who highlight the importance of the explainability of AI systems, especially in sensitive contexts such as education. On the other hand, Ahmad et al., (2024) warn of the risks associated with a lack of legal and ethical scrutiny, particularly in healthcare, where data protection and algorithmic bias mitigation are critical,

Several authors have also addressed the subjects of data protection and privacy. Huo & Siau, (2024) focus on the reliability of AI, highlighting concerns about the accuracy of

the information generated and data security, especially with regard to student privacy. Capano et al., (2025) add that regulation should mitigate the creation of false data, errors in outputs, and algorithmic biases, reinforcing the need for clear policies. This gap is also identified by Maina, A. M., & Kuria, J. (2024), who point to the absence of robust legal frameworks in many African countries, particularly regarding algorithmic transparency.

In the context of education, the United Nations Educational, Social and Cultural Organization (UNESCO) has proposed a regulatory framework for the utilisation of generative AI, with the objective of optimising benefits and mitigating risks (Shailendra et al., 2024). Camacho-Zuñiga et al., (2024) offer a complementary perspective by advocating for the implementation of ethical principles, including inclusion, diversity, equity and accessibility (IDEA). They further propose auditing data and algorithms to ensure user well-being. Regulation is also considered essential to prevent plagiarism and academic fraud, fostering confidence in the responsible use of AI (Espinoza Vidaurre et al., 2024).

A diversity of approaches to AI regulation is evident worldwide. In Turkey, for example, the National AI Strategy (2021–2025) is aligned with the principles of the EU AI Act, focusing on training specialists and international cooperation (Serpil & Kesim 2024). In turn, Sokhibov & Azamjonov, (2024) highlight the importance of mechanisms that ensure transparency, accountability and fairness, with particular reference to the protection of student data and the mitigation of algorithmic biases.

2.4 Factors and Challenges in the Adoption of AI in Education

The adoption of AI in education has been widely debated in recent literature, with emphasis on its benefits, challenges, and ethical implications. The studies analysed reveal a diversity of perspectives, highlighting both the transformative potential of AI and the obstacles to its effective implementation. This section is organised around three main themes: the factors influencing AI adoption, the observed impacts, and the associated ethical and operational challenges.

2.4.1 Factors Influencing the Adoption of AI

The adoption of AI is not uniform, varying significantly depending on institutional, cultural, and individual factors. As evidenced by Galindo-Domínguez et al., (2024), the digital competence of teachers, their professional expectations, and the enabling conditions of institutional support and technological access, are pivotal to the adoption of AI. This perspective is further elaborated upon by Capano et al., (2025), who emphasise the importance of institutional preparation and cultural contexts in the adoption of generative AI, highlighting regional variations. In Turkey, for example, Serpil & Kesim, (2024) demonstrate that collaboration between universities and industry is crucial for the practical application of AI and suggest strategic partnerships as a means to accelerate its integration.

2.4.2 Impacts of AI in the Educational Context

The studies analysed point to positive impacts of AI, particularly on student engagement and pedagogical efficiency. As posited by Bewersdorff et al., (2025) the utilisation of AI has been demonstrated to engender a marked augmentation in student interest, which, in turn, has been shown to reinforce their sense of self-efficacy. On the other hand, Huo & Siau (2024) identify benefits such as the automation of repetitive tasks and improved efficiency, although they warn of risks associated with cognitive dependence and the lack of clear institutional policies. The aforementioned authors propose a staged incorporation of generative AI, concomitant with the cultivation of competencies in prompt engineering, to maximise its advantages.

2.4.3 Ethical and Operational Challenges

Despite AI's potential, the literature highlights several challenges that may compromise its widespread adoption. Elbaz et al., (2024) refer to ethical obstacles, while Ahmad et al., (2024) highlight cultural barriers, particularly in Asia, where regional and demographic differences influence the perception and use of AI. In resource-constrained contexts, such as some African institutions, the lack of adequate technological infrastructure, insufficient financial resources, and a shortage of technical skills are

identified as critical barriers (Maina, A. M., & Kuria, J, 2024). Additionally, Camacho-Zuñiga et al., (2024) caution against potential hazards, including diminished human interaction, excessive reliance on technology, and deleterious consequences for the cultivation of critical competencies. They underscore the imperative for a harmonious equilibrium between innovation and the preservation of the fundamental elements of the educational process.

2.5 Artificial Intelligence in Higher Education

The integration of AI in higher education has been widely debated in recent literature, highlighting both its potential and the challenges it presents. This section organises the contributions of various authors around three central themes: the benefits of AI, ethical and academic concerns, and implications for institutional management.

2.5.1 Potential of AI in Education

One of the most widely agreed-upon aspects among researchers is AI's ability to personalise learning, adapting to students" individual needs. As Elbaz et al., (2024), have demonstrated, adaptive learning has the capacity to enhance both academic outcomes and the efficacy of the educational process. This perspective is corroborated by the findings of Ahmad et al., (2024), who highlight the educational efficiency achieved through personalisation and the simplification of administrative tasks. Sokhibov & Azamjonov, (2024) The notion that AI can facilitate student learning is further substantiated by the findings of a 2024 study. This study emphasises that AI-powered systems can adapt educational content to individual students" learning styles, thereby enhancing their performance.

In addition to personalisation, AI has been recognised as a valuable tool for modernising educational and research processes. Serpil & Kesim (2024) highlight its role in transforming traditional methods, while Roy et al., (2022) underscore its efficacy in automating repetitive tasks, such as examination marking, thereby enabling educators to concentrate on more sophisticated pedagogical concerns.

In this context, A. M. Maina and J. Kuria. (2024) note that adaptive learning platforms, virtual tutors, and simulated laboratories can overcome resource limitations by offering more accessible educational experiences.

2.5.2 Challenges and Concerns

Despite the advantages, the literature warns of several challenges associated with adopting AI. One of the main concerns relates to accessibility. Shailendra et al., (2024) have indicated that the accessibility of GenAI might be constrained by technological or regulatory impediments, which could exacerbate existing disparities in educational access.

Another recurring theme is the impact of AI on academic integrity. Camacho-Zuñiga et al., (2024) identify risks such as the production of plagiarised content and the erosion of critical thinking, while, Korseberg & Elken, (2024) concerns were raised regarding the potential implications of artificial intelligence for conventional assessment methods. This apprehension stemmed from AI's ability to produce textual outputs that are almost indistinguishable from those generated by human authors.

The ethical implications and the need for curriculum reform are also addressed by Huo & Siau (2024), who identify four main opportunities: knowledge acquisition, intelligent co-creation, augmented support, and personalised learning – but also difficulties, such as the assessment of AI-generated work and the need to redefine curricula to emphasise human skills, namely critical thinking and creativity.

2.5.3 Implications for Institutional Management

The influence of AI is not confined to education; it also has a substantial impact on the administration of higher education institutions. Sokhibov & Azamjonov, (2024) note that the automation of administrative tasks allows teachers to devote more time to teaching and supporting students. Bewersdorff et al., (2025) go further, arguing that educational programmes should promote not only AI literacy, but also positive attitudes and the practical use of its tools.

2.6 Adoption of AI in Higher Education

The integration of AI within higher education has become a focal point of academic inquiry, with numerous studies examining its prospective benefits, challenges, and ramifications. This section presents a critical synthesis of recent literature, organised around central themes that emerge from the works analysed: factors influencing AI adoption, strategies for its implementation, ethical and operational challenges, and the role of educational agents.

2.6.1 Factors Influencing the AI Adoption

Research has shown that the predisposition to use AI tools, such as ChatGPT, is closely linked to positive attitudes towards their usefulness, ease of use and convenience (Elbaz et al., 2024). This perspective is corroborated by Galindo-Domínguez et al., (2024), who highlight teachers' digital competence and their perceptions of technology as determining factors. On the other hand, Ahmad et al., (2024) emphasise the need to raise awareness of AI and address ethical concerns to ensure balanced adoption. The findings indicate that, in addition to technical aspects, the human and ethical dimensions play a crucial role in the acceptance of AI in the educational context.

2.6.2 Strategies for AI Implementation

Several authors have proposed models and strategies with a view to facilitating the integration of AI in higher education. Serpil & Kesim, (2024) argue that higher education institutions should promote gender equality, strengthen technological infrastructure, define clear institutional strategies, and expand collaboration. Similarly, Shailendra et al., (2024) present the "4E" framework (*Embrace, Enable, Experiment, Exploit*), which outlines progressive stages for the adoption of AI, from awareness to the exploitation of its potential, Camacho-Zuñiga et al., (2024) add that students recognise the benefits of AI for productivity and learning, but demand transparency and academic rigour, which reinforces the importance of clear institutional policies. A concerted, multifaceted approach is required to ensure the effective implementation of AI.

2.6.3 Ethical and Operational Challenges

The literature identifies several obstacles to the adoption of AI, ranging from a lack of technological competence to the absence of a clear strategic vision (Korseberg & Elken, 2024).Watanabe, (2023) warns of the need to balance technological innovation with the preservation of fundamental educational values, such as critical thinking and human interaction. Huo & Siau, (2024) go further by proposing that institutions should establish clear policies, promote AI literacy, reform assessment methods, and invest in teacher training. In addition, Sokhibov & Azamjonov, (2024) emphasise the importance of risk mitigation, with particular reference to the issues of algorithmic bias and data protection. The proposed approach to address these concerns involved implementing ethical and regulatory frameworks. It is evident that these challenges require a holistic approach, combining investment in infrastructure, training, and global collaboration (Capano et al., 2025).

2.6.4 The Role of Educational Agents

The training of teachers and other personnel is identified as a fundamental component for the successful integration of AI (Sokhibov & Azamjonov, 2024a). Bewersdorff et al., (2025) highlight the importance of inclusive educational strategies, while Huo & Siau, (2024) emphasise the need to balance technological innovation with human values such as responsibility and social interaction. It is evident that these perspectives underscore the notion that adopting AI is not merely a technical issue but also pedagogical and ethical, this underscores the necessity for the active involvement of all educational agents in the process.

3. Empirical Work

For the collection of primary data, a structured questionnaire was adapted and subsequently distributed to the IPC teaching staff. This research tool was carefully designed to cover multiple dimensions of the issue under study. Its structure incorporated two distinct types of questions that complement each other methodologically.

The closed questions, based on the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and Technology Readiness Index 2.0 (TRI 2.0) theoretical models, enabled the collection of quantitative, measurable data on faculty members' acceptance and predisposition towards AI. The questionnaire also included open-ended questions to elicit more in-depth qualitative perceptions. These questions were designed to capture not only the barriers identified by the study participants, but also the opportunities they foresee in adopting AI tools in the educational context.

In addition, the questionnaire included a set of demographic variables to contextualise the faculty members' profiles. These included, among other aspects, the scientific area in which the teachers work and their level of prior experience with AI technologies. These factors proved essential for a more differentiated analysis of the results obtained. This multidimensional approach enabled the construction of a comprehensive and nuanced picture of the teaching staff's attitudes and perceptions regarding the integration of AI into their pedagogical and administrative practices.

3.1 Objectives of the study and research questions

The instrument is organised into five main blocks: sociodemographic characteristics, experience with AI, dimensions of technology adoption (UTAUT2), cultural values, and perceptions about regulation, ethics, and risks of AI.

In terms of structure, the questionnaire includes an initial set of questions to characterise participants, covering variables such as gender, age, years of teaching experience in higher education, organisational unit and professional category. This is followed by questions on the frequency and contexts of AI use in teaching, research and administrative

activities, as well as items that seek to identify the AI tools most commonly used in everyday academic life.

The central dimensions of the UTAUT2 model are operationalised through statements relating to performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, perceived value, habit, and behavioural intention to use AI. These statements are evaluated on seven-point Likert scales, where 1 corresponds to 'strongly disagree' and 7 to 'strongly agree,' allowing for the assessment of the intensity of teachers' perceptions and attitudes regarding the adoption of technology. Additionally, specific items are included on anxiety about discriminatory bias, existential risks, and concern about the 'black box' of algorithms, as well as questions about knowledge of regulatory frameworks and preferences regarding the level at which ethical principles should be defined (macro, institutional, or micro).

As for the processing of information, the responses were analysed using descriptive statistics, such as means, modes, ranges and standard deviations, in order to characterise the different dimensions under study and explore patterns of association between variables.

3.2 Methodological Procedures

The instrument used in this study was not developed from scratch, but rather adapted from a questionnaire ("AI in higher education" – Diana Koroleva) that had already been validated and used in a global context involving other higher education institutions (Xi'an Jiaotong-Liverpool University; Higher School of Economics and University of Naples Parthenope).

3.2.1 Preparation

The instrument underwent adaptation to align with the context of the IPC and the overarching objectives of the research undertaking.

This careful adaptation to the context of the IPC focused mainly on scientific areas:

- Where only areas of training valid in the national context were considered;

- The response options referring to universities belonging to the IPC, thus ensuring that the instrument only contained valid responses for our target audience, the IPC teaching staff;

- The adaptation of professional categories, including only professional categories existing in the context of the IPC.

3.2.2 Ethics Committee

After the preparation phase of the data collection instrument, it was submitted to the IPC Ethics Committee, the entity responsible for evaluating the research's ethical aspects.

The submission process required the compilation of a comprehensive dossier that, in addition to the final questionnaire, included details of the study, including its objectives, methodology, data collection protocol, participant consent form, and assurances of confidentiality and anonymity. The initial submission was received and analysed by the committee members, who issued a conditional opinion.

In this opinion, of pertinent questions were raised, and further clarifications were requested on specific aspects considered to be of paramount importance in ensuring the rights of participants are protected. The Committee's observations on the matter are as follows:

-Detailed questions about the data collection method;

-Questions about the dissemination of the questionnaire by teachers;

-Questions about the privacy of participants, ensuring that, before the questionnaire began, **teachers expressed their free and informed consent**.

The study was submitted to the competent Ethics Committee for review, and the respective research protocol, questionnaire to be administered, and information for participants were presented. After analysing the documentation and confirming

compliance with the recommendations issued, the Ethics Committee issued a favourable opinion, formally authorising the dissemination and administration of the questionnaire (Opinion No. 99/2025).

This approval ensures that the data collection process complies with the principles of informed consent, confidentiality, anonymity, and personal data protection, guaranteeing the ethical integrity of the research.

3.2.3 Dissemination of the Questionnaire

The dissemination of the collection instrument is crucial to ensure a robust response rate and a representative sample of all IPC teachers and researchers, minimising non-response bias. To ensure that it was made available efficiently and officially to all members of the study population, an institutional dissemination strategy was chosen, implemented through a specialised office.

The questionnaire was created on the Google Forms platform, chosen for its ability to anonymise responses and ensure the complete privacy of participants' data. The link generated for completing the questionnaire was disseminated through the IPC's Office for Professional Development and Pedagogical Innovation (GAVIP).

The choice of this office is justified because GAVIP-IPC is the office responsible for promoting and supporting training activities at the IPC, and also because this office holds and manages the official and updated list of institutional contacts for all IPC teaching and research staff, ensuring that the survey is directed at the defined target audience in a complete and accurate manner.

The operational procedure consisted of the co-supervisor, Professor Isabel Pedrosa, sending the electronic questionnaire link to GAVIP-IPC, accompanied by an explanatory text about the study, requesting the recipients" collaboration (Appendix 2). GAVIP-IPC, in turn, was responsible for distributing this communication through the official mailing list system to IPC teaching and research staff with active contracts on 31 December 2024.

This method of dissemination, supported by an institutional entity, confers greater legitimacy and official status on the request for participation, increasing the likelihood that lecturers and researchers will participate. At the same time, it ensures that all data protection requirements are met, as I never had direct access to participants personal contact information, with GAVIP-IPC acting as a reliable intermediary that preserves their privacy.

The questionnaire was made available to teachers at the Polytechnic University of Coimbra (IPC) on 30 June 2025, with an initial response deadline of 11 July 2025. However, given the low number of responses obtained during this period, the collection deadline was extended to 31 July 2025.

3.2.4 Statistical Analysis of the Data

Descriptive statistical techniques were used to analyse the data collected through the questionnaire in order to characterise the sample and explore patterns in the main constructs under study. Measures such as means, modes, ranges and standard deviations were calculated for the Likert-scale items relating to technology readiness, the conditions that facilitate the use of AI, the different types of AI usage and the dimensions of anxiety, perceived risk and behavioural intention.

Due to the small number of valid responses (n = 25), it was not possible to apply the UTAUT2 model in its entirety or conduct robust inferential statistical analyses such as regression modelling or structural equation modelling. The small sample size would compromise the reliability and validity of statistical inferences, particularly with regard to the relationships between latent variables. For this reason, the UTAUT2 framework was primarily used as a theoretical reference, and the empirical results were interpreted in an exploratory and cautious manner.

The statistical analysis focused on identifying general trends and variability in respondents' perceptions rather than testing formal hypotheses. This descriptive approach highlighted central tendencies and dispersion in key indicators such as self-efficacy in using AI, perceived institutional support, anxiety levels about discriminatory bias and

existential risk, and the frequency and diversity of AI use in teaching and research activities.

3.3 Characterization of respondents

The sampling technique used, for convenience, relied on the voluntary participation of 25 teachers from the Polytechnic University of Coimbra, corresponding to 2.92% of responses out of a total of 849 teachers, and 8 researchers, none of whom responded to the questionnaire. The only feedback from respondents regarding the questionnaire referred to its length, which we associated with the low number of complete responses.

Table 1 describes the characteristics of the sample. The majority of respondents are female (72.00%), aged between 51 and 60 (60.00%), and most are experienced with more than 10 years of teaching (72.00%), with an average of 19.74 years; the Coimbra Institute of Engineering and Coimbra Education School accounted for 56.00% of responses (28.00% each), and the category of Adjunct Professor/Equivalent Adjunct Professor was the most represented at 56.00%.

Table 1: Sample Characteristics – Distribution (n=25)

Gender	Nº Answers	%
Male	7	28%
Female	18	72%
Age		
31-40	2	8%
41-50	7	28%
51-60	15	60%
60+	1	4%
Educational Institution		
Higher School of Education	7	28%
Higher Institute of Accounting and Administration	6	24%
Higher School of Technology and Management	2	8%
Higher Institute of Engineering	7	28%
Higher School of Health Technology	2	8%
Higher Agricultural School	1	4%
Position		
Assistant / Equivalent Assistant	4	16%
Coordinator Professor / Equivalent Coordinater Professor	7	18%
Adjunct Professor/Equivalent Adjunct Professor	14	56%
Years of Experience		
<10	7	28%
11-20.	3	12%
21-30	12	48%
31+	3	12%

Source: Own

Despite initial expectations regarding participation in the survey, the number of responses obtained proved to be low, which limits the statistical robustness of the results and requires caution in generalising the conclusions.

3.4 Presentation and Discussion of Results

The objective of this section is to present and discuss the findings from the aforementioned questionnaire, with a focus on investigating the correlations among variables that influence AI adoption in higher education. The analysis focuses on aspects such as self-efficacy, professional experience, ethical and existential anxiety, contractual arrangements, and training paths. The objective is to understand how these factors relate to teachers' practices and perceptions of AI use. This approach allows for a deeper understanding of the challenges and opportunities posed by AI integration in the IPC,

contributing to a critical and informed reflection on its impact on the academic reality of the institutions concerned.

Given the low number of responses obtained in the questionnaire (n = 25), it was not feasible to perform a statistical analysis of the UTAUT2 model as initially planned. The small sample size would compromise the reliability and statistical validity of the relationships between the variables predicted by this model. Therefore, this model was adopted only as a theoretical reference.

3.4.1 The Relationship between Confidence and Effective Use of AI

This section examines the question: "Is confidence in one's own knowledge to use AI positively correlated with a greater diversity of uses of the technology? That is, do teachers who feel more competent use AI for a wider range of tasks?" The aim is to understand whether perceptions of self-efficacy influence the breadth of AI's practical applications in the academic context, and to reveal the relationship between perceived competence and technological exploitation.

The study provided a solid methodological basis for understanding how self-efficacy relates to the diversity of AI uses in the academic environment. This research focused on two fundamental dimensions: on the one hand, teachers' self-efficacy, measured by question FC2 "I have the necessary knowledge to use AI" (on a scale of 1 to 7 points); on the other hand, the diversity of uses, assessed in questions 9.1 ("What do you use AI for in your work?" – version for teachers and researchers) and 9.2 ("What do you use AI for in your work?" – version for researchers) of the questionnaire.

The figures from this analysis present a compelling narrative of the current state of the academic community. The mean score achieved by the lecturers was 4.48 out of 7, indicating a moderately positive perception of their artificial intelligence skills. While this result is marginally above the midpoint, it also indicates significant potential for enhancement. The data indicate that the most common response is at the "partially agree" level, suggesting that many professionals feel reasonably confident but not entirely sure of their abilities.

The standard deviation of 1.39 is particularly noteworthy, as it underscores the heterogeneity within the teaching community. This substantial variability in perceptions of competence suggests the coexistence of distinct groups: some more confident and prepared to adopt AI tools, others still hesitant or unsure of their technical abilities. It is imperative to acknowledge the significance of this diversity of profiles when formulating an institutional implementation strategy.

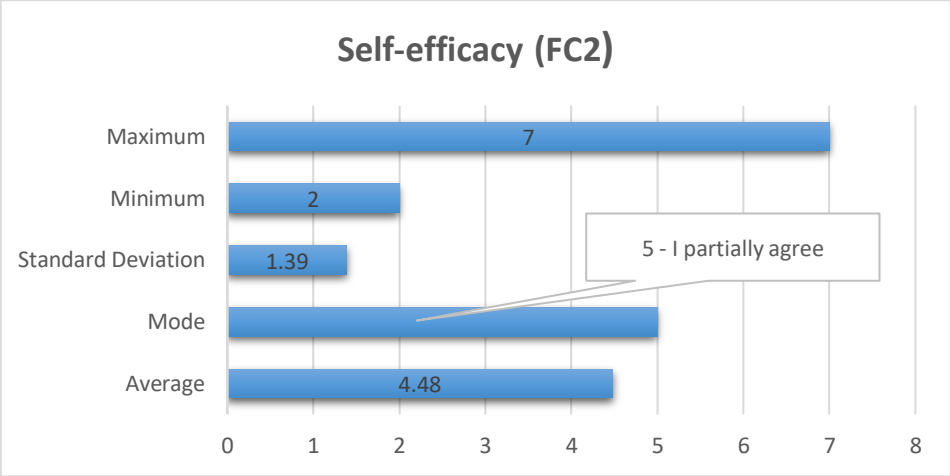

Figure 2: Self-efficacy

The scenario outlined in the IPC is both promising and challenging. The mean self-efficacy score observed is consistent with the findings of international literature on the subject, particularly those of (Galindo-Domínguez et al., 2024), which highlight teachers' digital competence as a determining factor for the success of technological integration. However, the significant dispersion of values echoes the concerns raised by Korseberg & Elken, (2024), who warn of the "insufficiency of technological skills" as a real, albeit uneven, obstacle among the teaching staff.

The identification of 23 distinct cases of AI use confirms the transformative potential of these technologies, corroborating the optimistic perspectives of authors such as Serpil & Kesim, (2024) and Ahmad et al., (2024) who see artificial intelligence as a unique opportunity to modernise both teaching practices and research processes. However, the contrast between this vast potential and the variability observed in levels of self-efficacy underlines the relevance of the reflections of Bewersdorff et al., (2025), according to

which the consolidation of self-efficacy depends fundamentally on the effective and consistent use of digital tools.

Given this reality, it is clear that the institution needs to develop more sophisticated and personalised pedagogical training strategies. The objective of teacher training must extend beyond mere skill acquisition, encompassing a tailored approach that acknowledges and addresses the distinct requirements of each profile. It is only then that the reduction of existing asymmetries will be possible, and that conditions will be created for all teachers to fully explore the wide range of applications that AI offers in the educational context.

3.4.2 Relationship Between Experience and Knowledge of AI

This section addresses the following question: "Is there a negative relationship between years of teaching experience and the perception of having the necessary conditions (resources and knowledge) to use AI? That is, do *teachers with more years of service feel less prepared for the integration of AI*?" This analysis seeks to assess whether academic seniority is a factor of resistance or a limitation to the adoption of AI, compared with teachers in the early stages of their careers.

Is there a relationship between years of teaching experience and the perception of having the necessary conditions (resources and knowledge) to use AI? That is, do teachers with more years of teaching feel less prepared to integrate AI?

The second dimension of this research focused on the relationship between teachers professional experience and the conditions that facilitate or hinder the adoption of AI. This analysis was based on professional experience, measured by question Q4 "How many full years have you worked in higher education?", and on facilitating conditions, assessed through questions FC2 ("I have the necessary knowledge to use AI") and FC4 ("I can get help from others when I have difficulties using AI").

The analysis yielded a profile characterised by its experience and maturity. The mean of 19.74 years of service indicates a teaching staff that has been at the institution for a considerable time, a common feature of Portuguese higher education. Interestingly, the

5-year mode indicates a significant presence of younger faculty members, suggesting an ongoing process of generational renewal, this apparent contradiction is clarified by the 27-year range of experience (4-31 years), which reveals an exceptional generational diversity within the institution.

The distribution shows a positive asymmetry, characterised by the presence of a "long tail" of lecturers with very high levels of experience. This statistical characteristic translates into a complex institutional reality, in which perspectives and pedagogical approaches shaped by very different historical and technological contexts coexist on a daily basis.

When we analyse the facilitating conditions, the data reveal specific challenges that deserve attention. The score for statement FC2 ("I have the necessary knowledge to use AI"), with an average of 4.48, is slightly below the overall average for facilitating conditions. This value indicates a degree of uncertainty regarding the individual's skill set. This phenomenon may be particularly evident among veteran teachers. It is indicative of a perceived deficit in technical skills.

Even more worrying is the score for statement FC4 ("I can get help from other people"), with an average of only 4.20. This result may reflect real technological isolation among teachers with more years of service, indicating less technology-oriented professional networks or the absence of effective AI mentoring mechanisms. Paradoxically, this vulnerability reinforces the reality experienced in the institutional context, accurately reflecting its challenges.

The analysis yielded a multifaceted and subtle picture, revealing generational dynamics pivotal to the formulation of strategies for AI adoption at the IPC. The coexistence of a high average experience (19.74 years) and a significant proportion of junior lecturers (as evidenced by the mode of 5 years) creates a unique institutional environment where consolidated pedagogical knowledge meets the potential for technological innovation.

Table 2: Professional experience in years

Average	19,74
Mode	5
Range	27

Source: Own

Table 3:Average Social Support (FC4) and knowledge (FC2)

FC4 – Social Support	4,2
FC2 - Knowledge	4,48

Source: Own

This heterogeneity resonates deeply with the perspectives of Galindo-Domínguez et al., (2024) who identify teachers' digital competence as a critical success factor. In the context of the IPC, this means that the institution will have to develop differentiated approaches that recognise and respond to this generational diversity.

The exceptional variability in professional experience becomes particularly significant when analysed in light of the warnings of Korseberg & Elken, (2024), who identify "lack of technological competence" as a central obstacle to AI integration. The data suggest that this obstacle is not homogeneous — it manifests itself differently depending on the teachers' profile. The lower values in facilitating conditions, especially in perceived knowledge (FC2: 4.48) and, even more markedly, in social support (FC4: 4.20), suggest that veteran teachers, despite their vast pedagogical experience, may feel less empowered and more isolated in the face of technological changes.

This potential "generational gap" goes to the heart of the implications for institutional management discussed by Sokhibov & Azamjonov, (2024). Perceptions of a lack of social support (FC4) suggest that generic training strategies may be insufficient to meet the real needs of the teaching community.

In line with the recommendations of Huo & Siau, (2024), the results point to the urgent need to create institutional mechanisms for reverse and collaborative mentoring. In this model, junior teachers – whose 5-year trend suggests greater native familiarity with technology – could support their veteran colleagues while benefiting from the latter's

pedagogical experience. This approach has been demonstrated to be effective in mitigating technological isolation, whilst concomitantly operationalising true "intelligent co-creation". The latter is a concept advocated by these authors for the successful integration of AI in the educational context.

3.4.3 Discriminatory Bias Anxiety and Regulatory Preference

This section analyses the question: “Do respondents who report higher levels of anxiety about AI’s discriminatory bias tend to prefer ethical principles to be defined at a macro level (legislative/by experts) rather than at a micro level (institutional/departmental)?” This issue seeks to understand how perceptions of ethical risk influence preferences for centralised or decentralised regulatory models in the academic context.

The growing anxiety about the discriminatory bias of artificial intelligence is not an isolated phenomenon; rather, it is part of a broader shift in higher education. In this context, ethical, regulatory and algorithmic governance issues are gaining increasing prominence. The analysis “Do respondents who report higher levels of anxiety about the discriminatory bias of AI tend to prefer ethical principles to be defined at a macro level (legislative/by experts) rather than at a micro level (institutional/departmental)?” shows that high levels of concern about algorithmic discrimination tend to lead to a preference for centralised regulation. This conclusion is supported by contemporary literature on the adoption of AI in educational environments.

The empirical study reveals that participants with greater anxiety about discriminatory bias (mean = 4.73 on a 7-point scale) prefer macro-level regulation, opting for ethical principles defined by legislative bodies and experts rather than decentralised approaches at the institutional or departmental level. This preference is consistent with the observations of Galindo-Domínguez et al. (2024), who underscored the imperative for judicious, critical utilisation of AI and emphasised transparency as a foundational component.

Table 4: Anxiety about Discriminatory Bias Average

	Average
AI treats people differently, which makes me anxious.	6,08
AI sets different prices (price discrimination) for different people, which is unfair.	4,64
It is unacceptable for AI to exhibit racial discrimination.	3,48
	4,73

Source: Own

There is an apparent convergence between individual anxiety and the demand for regulation, a phenomenon present in the work of Watanabe, (2023), who discusses the demand for clear guidelines for technological development and implementation, guided by respect for fundamental rights and privacy in the implementation of the EU AI Act.

Concerns about algorithmic discrimination were operationalised through indicators such as racial discrimination, unfair pricing and unequal treatment, in line with the IDEA principles advocated by Camacho-Zuñiga et al., (2024). These authors support auditing data and algorithms to ensure user well-being, a concern reflected in the study's results.

Ahmad et al., (2024) reinforce this perspective by warning of the risks associated with the absence of legal and ethical scrutiny, especially in sensitive areas such as health, where data protection and the mitigation of algorithmic biases are crucial, In educational environments engaged in the processing of sensitive student data, these issues assume heightened significance and underscore the necessity of adherence to centralised regulatory frameworks.

The literature shows consensus on the importance of transparency in AI governance. Roy et al., (2022) and Espinoza Vidaurre et al., (2024) emphasise the relevance of the explainability of AI systems, especially in educational environments, while Capano et al., (2025) highlight the "black box" nature of algorithms, which raises questions about transparency and accountability. These contributions reinforce the study's findings, whose context of anxiety about opaque algorithms makes the search for robust regulatory structures a natural and human response.

Self-efficacy in using AI is influenced by factors such as technological literacy, interest in technology, attitudes towards AI, and effective tool use. Thus, the anxiety identified in

Question 4.3.3 ("Respondents who report higher levels of anxiety about AI's discriminatory bias tend to prefer those ethical principles be defined at a macro level (legislative/by experts) rather than at a micro level (institutional/departmental)?") can be mitigated through investment in algorithmic literacy and ethical training, as argued by Bewersdorff et al., (2025). Huo & Siau, (2024) suggest that institutions establish clear policies, promote AI literacy, reform assessment methods, and invest in teacher training, complementing centralised regulation by empowering stakeholders to navigate this ecosystem ethically and reducing anxiety through knowledge.

The literature also presents implementation models that can address the concerns identified. The 4E framework, proposed by Shailendra et al, (2024), outlines progressive phases of AI integration, from awareness to exploitation of its potential, this model can facilitate the transition from anxiety to acceptance by proposing a structured path for ethical integration. Serpil & Kesim, (2024) add that institutions should promote gender equality, strengthen infrastructure, define clear strategies, and expand cooperation, measures that complement regulation with concrete institutional actions.

A comparative analysis also reveals important contextual challenges, such as the absence of robust legal frameworks in many African countries, particularly concerning algorithmic transparency, according to Maina, A. M., & Kuria, J. (2024). The inclination towards centralised regulation in these instances is influenced by geopolitical factors, indicating that in contexts characterised by heightened regulatory uncertainty, concerns regarding algorithmic bias tend to elicit a weaker institutional response.

The convergence between empirical grounded in legitimate concerns about fairness, transparency, and accountability. The choice of centralised regulation emerges as an understandable response and is in line with global trends in ethical governance. However, the literature indicates that regulation may not be enough. Watanabe, (2023) emphasises the significance of maintaining a balance between technological innovation and the preservation of educational values, including critical thinking and human interaction. It is evident that effective regulation necessitates the implementation of accompanying strategies, encompassing training, digital literacy, and ethical development. These

strategies are imperative for empowering communities to navigate the AI ecosystem autonomously and responsibly.

Regulation serves as an antidote to algorithmic anxiety. However, its effectiveness depends on integration with educational and institutional approaches that promote not only legal compliance, but also competence and confidence in the ethical use of AI.

3.4.4 Scientific Field and Use of AI in Quantitative Data

This section discusses the question: "To what extent does the scientific field (STEM vs Social Sciences/Humanities) influence the use of AI in quantitative data analysis in research?" The aim is to assess whether disciplinary affiliation influences the adoption of AI tools in quantitative research tasks.

When examining the central research question—whether the use of AI in quantitative data analysis is significantly influenced by the scientific field of teachers—there is a key mismatch between theoretical expectations and the empirical data collected. This discrepancy is even more relevant in light of the extensive literature on AI adoption in higher education.

The fundamental hypothesis posits that educators primarily use artificial intelligence for quantitative data analysis, thereby elevating this dimension to a dependent variable. However, an analysis of data on AI utilisation reveals that 74% is dedicated to text translation. This particular application is of instrumental significance, transcending conventional disciplinary boundaries. This trend corroborates the observations.

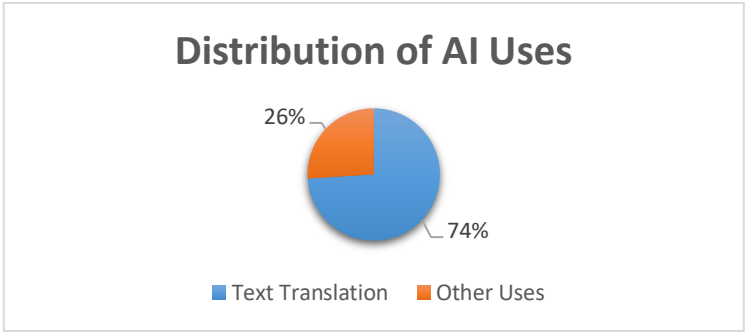

Figure 3: Distribution of AI Uses

The literature indicates that the adoption of AI is heterogeneous, varying according to institutional, cultural, and individual factors (Galindo-Domínguez et al., 2024). Bewersdorff et al., (2025) reinforce that self-efficacy in the use of AI depends on technological literacy, interest, attitudes, and experience of use. Thus, the predominance of translation as an AI application stems from its simplicity, immediate usefulness, and wide accessibility, requiring no advanced knowledge.

Another problematic point lies in the disciplinary categorisation of teachers. The substantial weight of the Economics and Management area, with 28% of the sample (Figure 5), as a hybrid discipline, highlights the inadequacy of a simplistic division between STEM and Social/Human Sciences. Ahmad et al., (2024) emphasise the role of cultural barriers, particularly in Asia, where regional and demographic variations influence perceptions and utilisation of AI. This study underscores the potential for disciplinary divisions to obfuscate more intricate and nuanced adoption dynamics.

Capano et al., (2025) mention the importance of institutional preparation and cultural contexts in the adoption of generative AI, highlighting regional variations and suggesting the need for more nuanced taxonomies. Such perspectives indicate that traditional classifications should be rethought in light of effective practices.

Elbaz et al., (2024) show that the preference for AI tools, such as ChatGPT, is related to positive attitudes towards usefulness, ease of use, and convenience. It is widely acknowledged amongst pedagogues that applications which provide concrete and immediate benefits are held in high esteem. This appreciation is consistent across all subject areas.

Watanabe, (2023) emphasises the need to combine technological innovation with the preservation of educational values, advocating an approach based on empirical reality. Huo & Siau, (2024) propose institutional measures such as clear policies, promotion of AI literacy, the implementation of reforms in assessment methods, and the allocation of resources to teacher training. It was further recommended that research be reformulated to acknowledge the diversity of AI applications, as evidenced by the data.

A critical analysis of the research question, supported by extensive literature, indicates that the hypotheses should align with the observed adoption patterns. The field of translation, as the primary application, demonstrates that the determining factors for adoption transcend disciplinary boundaries, emphasising the technology's usefulness, ease of use, and direct applicability.

Bewersdorff et al., (2025) underscore the pivotal role of both human and ethical dimensions in the acceptance of AI within educational settings. Research must acknowledge the prevailing patterns of utilisation, elucidates the underlying factors contributing to the observed discrepancy between the theoretical potential and its practical implementation, and explores the factors that propel the advancement of AI in academic settings.

3.4.5 Use of Generative AI and Existential Anxiety

The analysis focuses on the question: "Do teachers who report greater use of GenAI (and who are therefore potentially more exposed to and familiar with the technology) show less existential anxiety (about social risks and extinction) than those who use it less?" The aim is to explore the relationship between technological familiarity and the perception of existential risks associated with AI.

The results of Question f) (GenAI) reveal a counterintuitive pattern between the use of GenAI and levels of existential anxiety, reinforced by contemporary scientific literature. The analysis shows that teachers who are more familiar with GenAI do not necessarily have lower levels of existential anxiety, which is in line with several theoretical currents. Shailendra et al., (2024) have previously cautioned against the potential repercussions of technological advancement, including concerns about academic integrity, privacy, cognitive bias, and accessibility. These observations underscore the notion that increased technology use does not necessarily lead to lower anxiety levels.

The "black box" nature of AI systems, highlighted by Capano et al., (2025), contributes to this phenomenon as teachers interact more with the tools, the density of algorithmic processes becomes evident, fuelling concerns about transparency and accountability.

Galindo-Domínguez et al., (2024) reinforce that familiarity can lead to a more cautious and, paradoxically, more anxious attitude, requiring safe, responsible and critical use of AI.

The prevailing literature on the subject corroborates the notion that elevated levels of anxiety, particularly in contexts of personal preferences and information gathering, are to be expected. Ahmad et al., (2024) highlight the risks arising from the absence of legal and ethical scrutiny, particularly in data protection and the mitigation of algorithmic biases. Thus, experienced teachers tend to develop a keen awareness of the ethical dilemmas posed by AI, making technical knowledge a catalyst for existential concerns. Huo & Siau, (2024) reinforce this view by emphasising the importance of AI reliability, associated with the accuracy and security of the data generated.

The observed difference of 32 percentage points between low usage (44%) and high anxiety (76%) can be explained by the concept of "informed knowledge", discussed by Watanabe, (2023), who warns of the need for a balance between technological innovation and the preservation of educational values. The cultivation of critical awareness has been demonstrated to engender profound existential tensions, thus necessitating rigorous introspection. Bewersdorff et al., (2025) present a complementary view by demonstrating that factors such as AI literacy, interest in technology, and attitudes influence self-efficacy, and that greater literacy can broaden perceptions of risk, generating a cycle in which greater competence corresponds to greater anxiety.

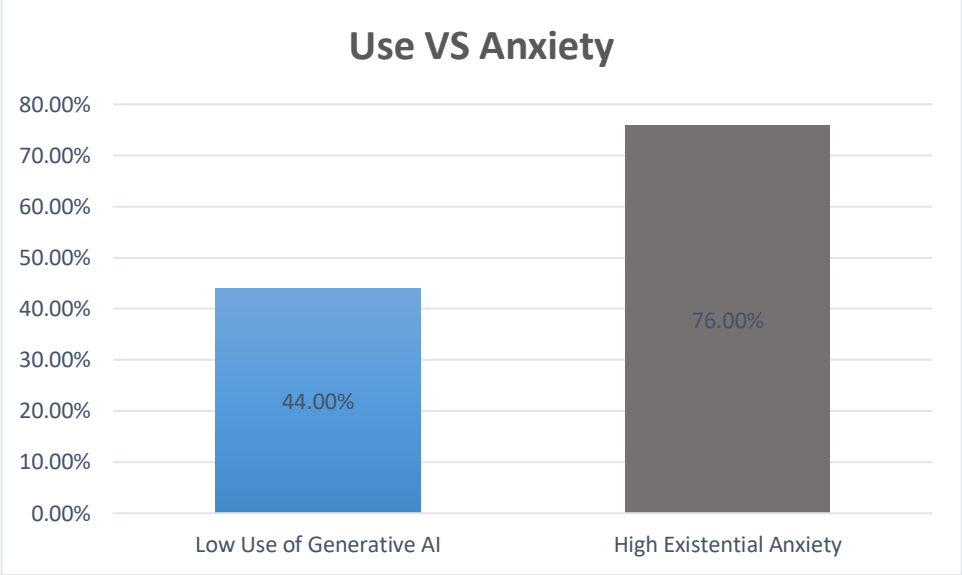

Figure 4: Use versus Anxiety

From an institutional perspective, the results challenge the assumptions underlying the implementation strategies suggested in the literature. Even progressive frameworks such as 4E, presented by Shailendra et al., (2024), show that the initial phase of technical acceptance is more complex, also requiring the management of existential anxiety. Sokhibov & Azamjonov, (2024) highlight the urgency of mitigating risks, such as algorithmic bias and data protection, through ethical and regulatory policies. The robustness of these approaches is vital teachers psychological well-being.

The methodological limitations pointed out in this issue are paralleled by gaps in the scientific literature. Korseberg & Elken, (2024) draw attention to obstacles such as a lack of technological competence and absence of a strategic vision, highlighting the need for more detailed research on user subgroups. Capano et al., (2025) highlight the relevance of cultural contexts, suggesting that future research consider technical, demographic, and organisational dimensions, in addition to cultural and regional ones, when studying the relationship between familiarity and anxiety.

The convergence between empirical results and the theoretical framework reinforces the validity of the observations, showing that existential anxiety about AI stems from structural tensions inherent in the adoption of disruptive technologies. The relationship

between technological familiarity and anxiety involves ethical, regulatory, and epistemological factors that go beyond technical competence. In Huo & Siau, (2024) the emphasis was placed on the notion that a concomitant responsibility and social interaction must accompany advancements in technology. The integration of technical and pedagogical components within effective institutional policies is of paramount importance. However, it is equally crucial to encompass psychological support and ethical reflection. It is imperative to recognise that existential anxiety may signify critical maturity rather than merely resistance to innovation.

3.4.6 Frequency of Generative AI Use and "Black Box" Anxiety

This section addresses the question: "Do teachers who are frequent users of Generative AI (and who therefore derive direct benefits from the technology) show less concern about the lack of transparency ("black box" anxiety) than occasional users?" The reflection focuses on the relationship between the intensity of use and concerns about algorithmic opacity.

The incorporation of generative AI in higher education seeks to balance innovation, explainability, and human values. Recent studies highlight that, although there are pedagogical and administrative benefits, ethical, operational, and regulatory challenges remain that condition responsible acceptance Ahmad et al., (2024), Camacho-Zuñiga et al., (2024), Espinoza Vidaurre et al., (2024), Huo & Siau, (2024), Korseberg & Elken, (2024) and Roy et al., (2022). It has been observed that teachers who use AI more frequently tend to show less anxiety about algorithmic opacity, although this effect depends on context, digital literacy and institutional policies.

The data collected provides a valuable insight into this reality. The most prevalent frequency of AI technology utilisation in professional activities was "I use them regularly," reported by 7 of the 25 participants. This finding suggests a favourable trend towards familiarity with these tools. It can be hypothesised that this recurrent utilisation may be associated with greater tolerance for algorithmic opacity.

However, the perception of the difficulty of keeping up with the AI evolution reveals a more complex scenario. The statement "AI technology updates too quickly and is very difficult to learn" scored an average of 3.44 on a scale of 1 to 7, with a mode of 4 and a standard deviation of 1.83. These values suggest a moderate perception of difficulty, with significant dispersion among participants. The minimum recorded was 1, and the maximum was 7, which shows marked heterogeneity in individual experiences. Such variability underscores the need for differentiated training and institutional support strategies that respond to diverse needs and levels of digital literacy.

Table 5: Learning Anxiety

Average	3.44
Standard Deviation	1.83
Mode	4
Maximum	7
Mínimum	1

Source: Own

The integration of AI within higher education has been demonstrated to be transformative, primarily through the means of personalised learning, automated tasks and institutional support. However, this development gives rise to significant concerns regarding academic integrity, privacy and the potential for bias. Research operationalises frequency of use and black box anxiety, suggesting that the ceiling effect — concentration of responses at high levels of concern — may affect the variance of results (Bewersdorff et al., (2025), Galindo-Domínguez et al., (2024), Huo & Siau, (2024) and Serpil & Kesim, (2024).

Explainability emerges as a central element in ensuring trust, and it is essential to promote audits, mitigate bias, and ensure data protection (Capano et al., (2025), (Shailendra et al., (2024). The impact of lower anxiety among frequent users is modest, and it is important to complement familiarity with critical literacy and transparency to avoid conflicts in the face of risks (Camacho-Zuñiga et al., (2024), Espinoza Vidaurre et al., (2024).

The adoption of AI is predicated on several factors, including digital skills, perceived usefulness, institutional support, and adequate resources. However, it is important to note that this process is also impeded by factors such as inequalities in access and regulatory gaps (Ahmad et al., (2024), Maina, A. M., & Kuria, J. (2024), Korseberg & Elken, (2024)). The integration of individual and systemic perspectives corroborates the notion that sustainable benefits are realised only through the application of ethics and continuous training when the frequency of use is considered.

In practical terms, it is recommended to invest in technical and ethical training, regular audits, clear policies, and teacher skills development (Shailendra et al., (2024), Watanabe, (2023), Serpil & Kesim, (2024), Sokhibov & Azamjonov, (2024)), thereby strengthening trust. The inclusion of algorithmic literacy and authentic assessment in curricula is essential to prevent plagiarism and cognitive dependence and to stimulate distinctive human skills. Future research should test mediations and moderators, such as self-efficacy and institutional support, and expand sample diversity.

It can be concluded that the relationship between familiarity and lower anxiety towards black boxes is consistent, but requires robust governance and explainability mechanisms (Ahmad et al., (2024), Camacho-Zuñiga et al., (2024), Capano et al., (2025), (Espinoza Vidaurre et al., 2024)). The concept of responsible progress entails transforming familiarity into critical trust, founded on clear policies and continuous audits. This process is instrumental in promoting the ethical and humanised adoption of generative AI in higher education.

3.4.7 Behavioural Intention and Existential Risk Anxiety

The following discussion will address the following question: "Is there a significant correlation between the Behavioural Intention to use AI and Existential Risk Anxiety? In other words, are teachers who plan to use AI more the ones who are least concerned about its large-scale risks, or are these perceptions independent?" The objective of this study is to determine whether there is an inverse relationship between the propensity to adopt technology and perceptions of global risks.

This analysis examines the relationship between BI to use AI and Existential Risk Anxiety among higher education teachers, based on theoretical models of technology acceptance. The data were obtained through a questionnaire that used a 1-7 scale. This method of data collection enabled the determination of specific averages for each construct.

In the BI dimension, the results show: BI1 ("I intend to continue using AI in the future") with 5.48, BI2 ("I will always try to use AI in my daily life") with 4.24, and BI3 ("I plan to continue using AI frequently") with 4.96, resulting in an overall average of 4.89. For Existential Risk Anxiety, the following were recorded: A1 ("AI may harm humans to achieve a goal") with 4.36, A2 ("I am concerned that the control of AI by some people introduces major risks") with 4.60, and A3 ("The uncontrolled development of super AI will reduce the time of humanity's existence") with 5.08, obtaining an average of 4.68.

The descriptive results show a dual pattern: a moderate-to-high predisposition to continued AI use (4.89) and a moderate-to-high level of concern about existential risks (4.68). This coexistence contradicts traditional models of technology acceptance, which postulate a simple inverse relationship between intention to use and perception of risk, suggesting that participants distinguish between immediate practical utility and long-term systemic risks, aligning with growing ethical concerns in AI.

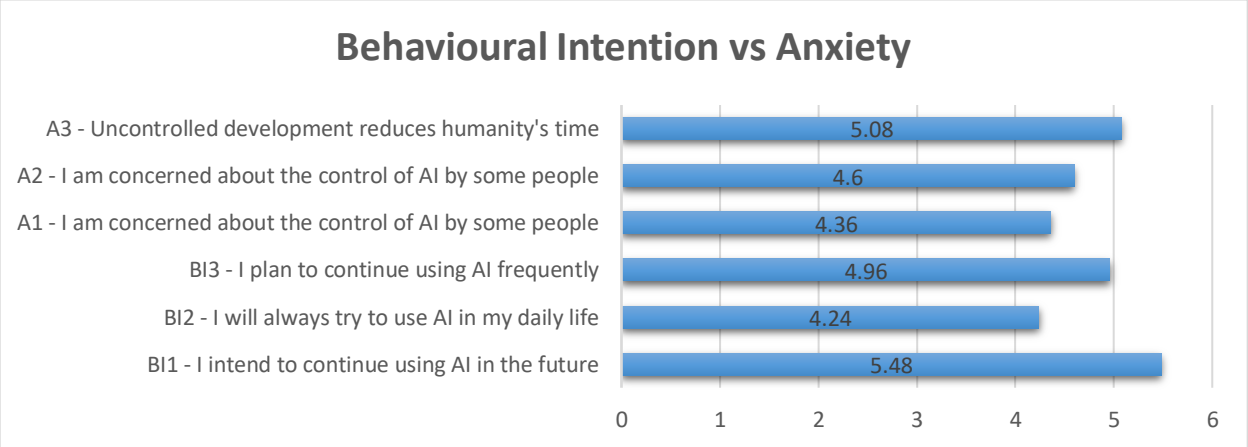

Figure 5: Behavioural Intention vs Anxiety (Average)

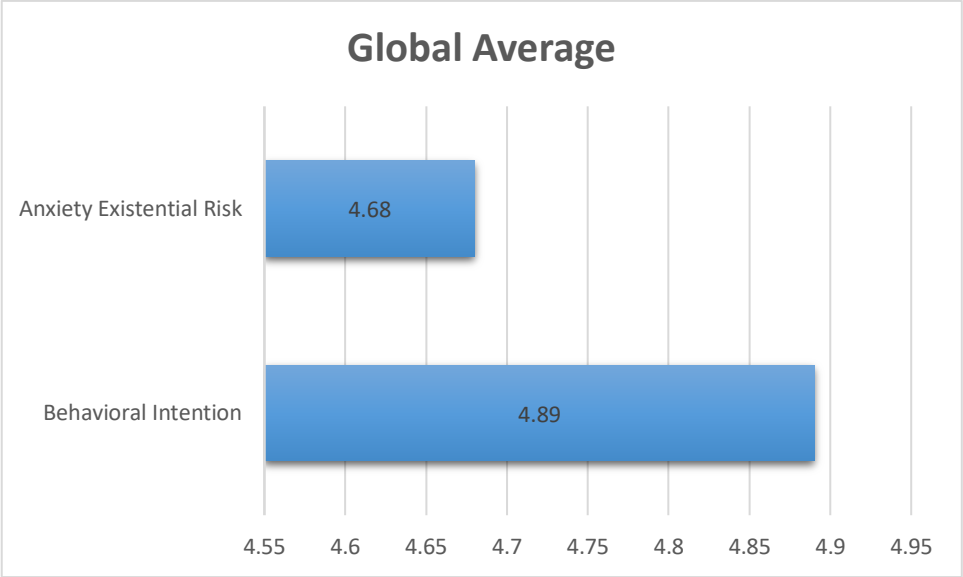

Figure 6: Global Average between Behavioural Intention and Anxiety

From a methodological point of view, analysis based exclusively on descriptive averages limits inferences about the statistical nature of the relationship between variables. The literature on risk perception recommends correlational analyses with Pearson or Spearman coefficients, verification of assumptions, and multiple regression models to control for relevant covariates.

The limitations of this analysis include the absence of formal statistical inference, control for covariates, and potential social desirability bias. Future research, based on the theoretical foundations of technology acceptance, should incorporate comprehensive correlational analyses, mediation/moderation models, and qualitative methods to deepen understanding of the mechanisms underlying the observed duality.

It is concluded that a clear inverse correlation between behavioural intention to use AI and existential risk anxiety is not confirmed. Concomitantly, pedagogues manifest a propensity to persist in the use of artificial intelligence whilst concurrently articulating substantial apprehensions about systemic risks. This phenomenon evinces an as yet incomplete conceptual autonomy between the constructs, thus necessitating theoretical models that are capable of apprehending the intricacies of attitudes towards emerging technologies within the context of education.

3.4.8 Habit vs Behavioural Intention as Predictors of Use

This section examines the question: "Is Habit (HT), or the lack thereof, a stronger predictor of actual Frequency of Use (Q8) than Behavioural Intention (BI) itself?" The analysis seeks to determine whether established practice outweighs stated intention as an explanatory factor for actual AI use.

This analysis investigates whether Habit (HT) better predicts Frequency of Use (Q8) than Behavioural Intention (BI).

Frequency of Use (Q8) is the dependent variable, measured on an ordinal scale from 1 to 5, with a mode of "I use it regularly" (category 5) in 7 of the 25 responses. The predictor variables are Habit (HT), with a mean of 3.06 on a 7-point scale, and Behavioural Intention (BI), with a mean of 4.89 on the same scale.

The difference of 1.83 points between the constructs" means is substantial, Behavioural Intention presents consistently higher values (BI1=5.48; BI2=4.24; BI3=4.96), while Habit shows greater internal heterogeneity (HT1=3.96; HT2=2.04; HT3=2.76; HT4=3.48), suggesting possible problems of internal consistency in the construct.

The convergence between the high average BI (4.89) and the frequent use mode indicates logical consistency between intention and actual behaviour. Conversely, the moderate HT average (3.06) is insufficient to explain, in isolation, the high frequency of use observed. This pattern is consistent with contexts of technological adoption where behavioural intention chronologically precedes the formation of consolidated habits.

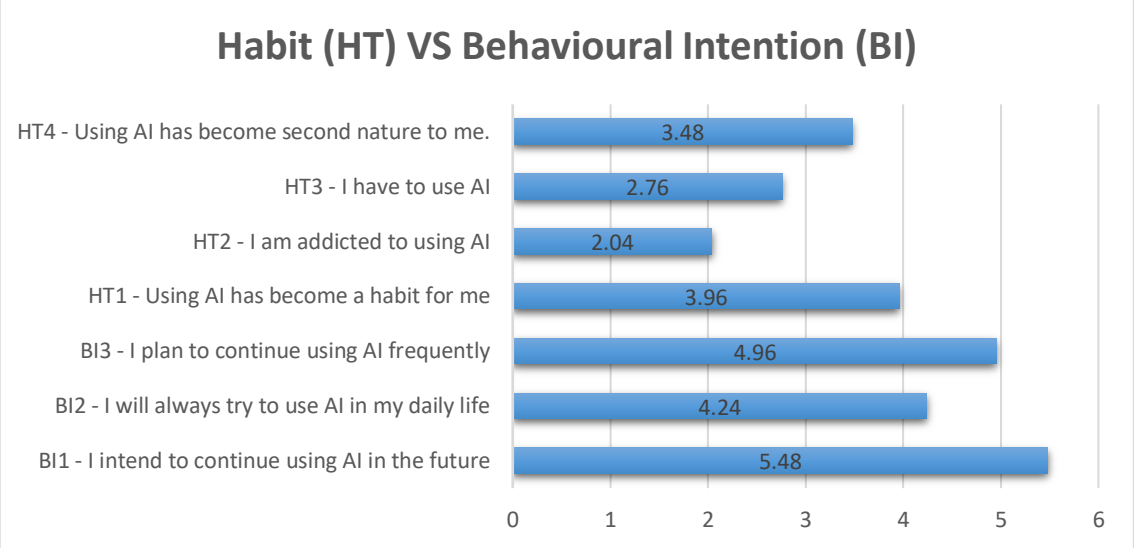

Figure 7: Habit vs Behavioural Intention (Average)

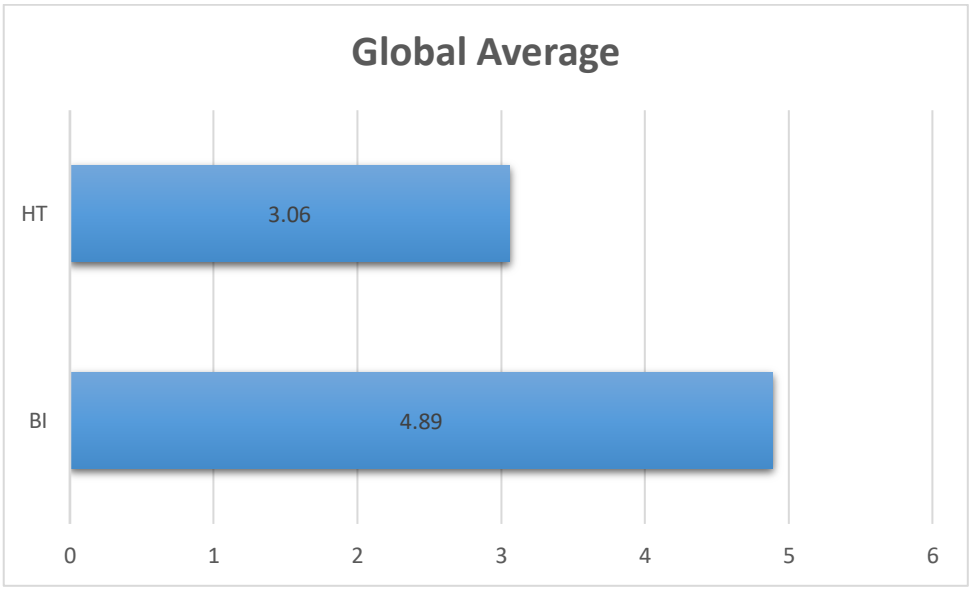

Figure 8: Global Average between Habit and Behavioural Intention

The results suggest that BI is a more effective predictor of Frequency of Use than Habit. However, these conclusions are based on descriptive analyses and do not include correlations, regression models or statistical significance tests. For rigorous inferential confirmation, it is recommended to implement ordinal regression models with comparison of standardised coefficients and an analysis of the validity of the measurement instruments.

4. Conclusion

The study aimed to analyse how teachers at the Polytechnic University of Coimbra perceive and adopt AI, as well as how regulatory and cultural factors shape this adoption. Although the sample was limited (25 responses), the results provide a summary answer to the research questions.

Firstly, it was found that teachers express an overall positive predisposition to use AI, showing moderate levels of self-efficacy and a high behavioural intention to continue using these tools. However, its effective use remains concentrated on writing and translation support tasks, falling short of the potential identified in the literature to support data analysis, personalisation of learning, and pedagogical decision-making.

Secondly, it was found that professional experience does not translate uniformly into greater preparedness to integrate AI, with differences observed between younger and more experienced teachers, both in terms of perceived skills and available social support. This heterogeneity confirms the importance of differentiated training strategies and mentoring mechanisms that bring different generational profiles closer together.

Thirdly, analysis of cultural dimensions and perceptions of regulation shows that anxiety about discriminatory bias and the existential risks of AI is associated with a preference for ethical principles defined at macro levels (legislative or institutional) and clear guidelines on acceptable uses. This suggests that trust in AI in higher education depends not only on individual skills, but also on the existence of transparent and reliable regulatory frameworks..

In summary, it can be concluded that the adoption of AI in the IPC is both necessary and desirable, but is still in its early stages, marked by incipient practices, internal asymmetries and significant ethical concerns. The institution must therefore take an active role in defining policies, providing secure infrastructure and promoting continuous training in order to create conditions that allow for the integration of AI in an ethical and effective manner, in line with the educational mission of higher education..

4.1 Contributions

This dissertation makes significant contributions by mapping and organising what IPC teachers actually think and do when adopting Artificial Intelligence. The work goes beyond a simple diagnosis: it also analyses the cultural and regulatory factors that underpin the decisions and hesitations of these professionals. What is mentioned are concrete clues for those who need to think strategically about the integration of AI in the institution, reinforcing the urgent need for continuous training, clear ethical guidelines and support mechanisms that make teachers feel safe and accompanied in this process.

But the scope of this research is not limited to the local context. By comparing the results obtained at IPC with international literature, this work enables a broader, more comparative dialogue on how AI is entering higher education across different contexts. This articulation initiates a new research paradigm, delving into the intricate interplay among organisational cultures, public policies, and regulatory frameworks in shaping the adoption of these technologies in the educational sector. The study aims to explore the dynamics that influence the integration of these technologies, and the potential constraints that may impede or facilitate this process.

4.2 Limitations

It is important to recognise that the small number of participants (n=25, representing a response rate of less than 3%) was a significant limitation of this research. The truth is that more responses to the questionnaire were expected, which would have made the statistical analysis more robust and provided a more complete picture of how teachers view and understand Artificial Intelligence. With a larger sample, it would have been possible to apply the UTAUT2 model in its entirety, test the relationships among variables, validate the hypotheses more rigorously, and apply structural equation models (if the sample had exceeded 200 responses).

The scarcity of responses also prevented more detailed comparisons between teachers from different scientific areas, with different contractual relationships or varying levels of professional experience. These comparisons could have revealed quite different

patterns of AI adoption across groups, providing concrete clues for tailoring the institution's policies to each teacher's profile. Another consequence of this limitation was the difficulty in performing a more in-depth triangulation between quantitative and qualitative data: although some interesting insights emerged from the open-ended responses, more diverse participation would have significantly enriched the analysis, allowing for the inclusion of institutional aspects.

4.3 Future Recommendations

Taking into account the results obtained and the limitations identified, it is now important to present recommendations for future research and to help design institutional strategies at IPC to adopt AI in its teachers practices.

The first recommendation is to conduct studies with larger, more diverse samples, which would allow for more robust statistical analyses and more meaningful comparisons among faculty members from different scientific areas, with different types of contracts and varying levels of experience.

Secondly, it would be advantageous to use mixed methods, i.e., to complement the questionnaires with qualitative methods, such as semi-structured interviews or focus groups, to capture deeper perceptions and explore cultural and institutional aspects that are difficult to elicit in closed-ended questions. The combination of methods would provide a more complete view of the phenomenon under study.

The third recommendation focuses on the proposal to develop longitudinal studies capable of monitoring and capturing the evolution of teachers perceptions and practices over time. Technological advances are increasingly rapid, and the presence of artificial intelligence in the daily lives of teachers and researchers is becoming pervasive. It is therefore logical to investigate how familiarity, trust, and effective use of AI are affected by teachers' experience and the institution's implementation of new policies.

Finally, as this work is part of the research of an international network of researchers, it is important that this cooperation is not lost, allowing comparative research to be carried

out between universities in different countries, particularly considering universities that have adopted AI early on and included it in teaching and coursework, including these rules in their AI use policies, establishing a distinction with other universities where this happened later. The present study will place the IPC within the global context of AI adoption in higher education, with a view to contributing to more informed reflection on current practices.

BIBLIOGRAPHICAL REFERENCES

Maina, A. M., & Kuria, J. (2024). Building an AI future: Research and policy directions for Africa's higher education. In 2024 IST-Africa Conference, Dublin, Ireland, 20–24 May 2024. IST-Africa Institute & IIMC International Information Management Corporation Ltd. ISBN 978-1-905824-73-1.

Ahmad, M., Subih, M., Fawaz, M., Alnuqaidan, H., Abuejheisheh, A., Naqshbandi, V., & Alhalaiqa, F. (2024). Awareness, benefits, threats, attitudes, and satisfaction with AI tools among Asian and African higher education staff and students. *Journal of Applied Learning and Teaching*, *7*(1). https://doi.org/10.37074/jalt.2024.7.1.10

Bewersdorff, A., Hornberger, M., Nerdel, C., & Schiff, D. S. (2025a). AI advocates and cautious critics: How AI attitudes, AI interest, use of AI, and AI literacy build university students' AI self-efficacy. *Computers and Education: Artificial Intelligence*, *8*. https://doi.org/10.1016/j.caeai.2024.100340

Camacho-Zuñiga, C., Rodea-Sánchez, M. A., López, O. O., & Zavala, G. (2024). Generative AI Guidelines by/for Engineering Undergraduates. *IEEE Global Engineering Education Conference, EDUCON*. https://doi.org/10.1109/EDUCON60312.2024.10578870

Capano, G., He, A. J., & McMinn, S. (2025). Riding the tide of generative artificial intelligence in higher education policy: an Asian perspective. *Journal of Asian Public Policy*. Routledge. https://doi.org/10.1080/17516234.2025.2450571

Elbaz, A. M., Salem, I. E., Darwish, A., Alkathiri, N. A., Mathew, V., & Al-Kaaf, H. A. (2024). Getting to know ChatGPT: How business students feel, what they think about personal morality, and how their academic outcomes affect Oman's higher education. *Computers and Education: Artificial Intelligence*, *7*. https://doi.org/10.1016/j.caeai.2024.100324

Espinoza Vidaurre, S. M., Velásquez Rodríguez, N. C., Gambetta Quelopana, R. L., Martinez Valdivia, A. N., Leo Rossi, E. A., & Nolasco-Mamani, M. A. (2024). Perceptions of Artificial Intelligence and Its Impact on Academic Integrity Among University Students

in Peru and Chile: An Approach to Sustainable Education. *Sustainability (Switzerland)*, *16*(20). https://doi.org/10.3390/su16209005

European Union. (2024). Artificial Intelligence Act (Regulation (EU) 2024/1689). Official Journal of the European Union

Galindo-Domínguez, H., Delgado, N., Campo, L., & Losada, D. (2024). Relationship between teachers' digital competence and attitudes towards artificial intelligence in education. *International Journal of Educational Research*, *126*. https://doi.org/10.1016/j.ijer.2024.102381

Geert Hofsted. (2001). Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations. https://doi.org/10.1509/jmkg.67.2.151.18611

Huo, X., & Siau, K. L. (2024). Generative Artificial Intelligence in Business Higher Education: A Focus Group Study. *Journal of Global Information Management*, *32*(1). https://doi.org/10.4018/JGIM.364093

Korseberg, L., & Elken, M. (2024). Waiting for the revolution: how higher education institutions initially responded to ChatGPT. *Higher Education*. https://doi.org/10.1007/s10734-024-01256-4

Roy, R., Babakerkhell, M. D., Mukherjee, S., Pal, D., & Funilkul, S. (2022). Evaluating the Intention for the Adoption of Artificial Intelligence-Based Robots in the University to Educate the Students. *IEEE Access*, *10*, 125666–125678. https://doi.org/10.1109/ACCESS.2022.3225555

Serpil, H., & Kesim, E. (2024). Understanding the Application of AI in Higher Education Systems: Global Perspectives From a Local AI Ecosystem. *Open Praxis*, *16*(4), 645–662. https://doi.org/10.55982/openpraxis.16.4.725

Shailendra, S., Kadel, R., & Sharma, A. (2024). Framework for Adoption of Generative Artificial Intelligence (GenAI) in Education. *IEEE Transactions on Education*, 1–9. https://doi.org/10.1109/te.2024.3432101

Sokhibov, R., & Azamjonov, A. (2024). The Step towards Future Targeted Spruce Pedagogy Through AI Based Models. *2024 4th International Conference on Advance Computing and Innovative Technologies in Engineering, ICACITE 2024*, 545–551. https://doi.org/10.1109/ICACITE60783.2024.10617068

Watanabe,, A. (2023). Exploring Totalitarian Elements of Artificial Intelligence in Higher Education With Hannah Arendt. *International Journal of Technoethics*, *14*(1). https://doi.org/10.4018/IJT.329239

APPENDIX 1. Questionnaire

Análise Exploratória da Adoção de IA no Ensino Superior: Regulamentação, Influências Culturais e Aplicações Práticas no Instituto Politécnico de Coimbra (IPC)

Este questionário integra um estudo internacional que envolve instituições de ensino superior de cinco países, entre elas o IPC. O trabalho original intitula-se Exploratory Cross-Country Analysis of AI Adoption in Higher Education: Regulatory Frameworks, Cultural Influences, and Practical Applications in Polytechnic University of Coimbra.

Este questionário faz parte do trabalho empírico de Dissertação do estudante Rodrigo Camões, aluno de Mestrado de Sistemas de Informação de Gestão, Instituto Superior de Contabilidade e Administração de Coimbra (ISCAC), sobre orientação das Professoras Verónica Vasconcelos (ISEC), Isabel Pedrosa (ISCAC) e Diana Koroleva (University of Naples Parthenope).

CARACTERÍSTICAS SOCIODEMOGRÁFICAS

Por favor, responda a algumas perguntas sobre si e a sua experiência com aplicações de inteligência artificial,

1. Indique o seu género:

1. Masculino
2. Feminino
3. Outro
4. Prefiro não responder

2. É cidadão português? (Se tiver várias nacionalidades, responda com base naquela que considera mais importante para si. Caso não queira responder, por favor escreva "Não respondo")

_____ (Pergunta aberta)

3. Por favor, indique a sua idade:

1. 18–30
2. 31–40
3. 41–50
4. 51–60
5. 60+

4. Quantos anos completos trabalhou no ensino superior (nesta e noutras instituições a 25/06/2025)?

_____ (Pergunta aberta)

5. Leciona?

1. Sim
2. Não

5.1 O regime contratual é integral?

1. Sim
2. Não.

5.1.1 Qual a percentagem (%) de contrato? (Esta pergunta é para os professores que responderam "Não" à pergunta 4.2)

_____ (Pergunta aberta)

5.2 Qual das categorias abaixo se adequa à sua situação? (Esta pergunta é para professores que responderam "sim" à pergunta 4)

1. Assistente / Assistente convidado
2. Professor adjunto / Professor adjunto convidado
3. Professor Coordenador / Professor Coordenador convidado
4. Professor Coordenador principal

5.3 Para qual das seguintes instituições presta serviços?

1. Escola Superior Agrária
2. Escola Superior de Educação
3. Escola Superior de Tecnologia e Gestão
4. Escola Superior de Tecnologia da Saúde
5. Instituto Superior de Contabilidade e Administração
6. Instituto Superior de Engenharia
7. Serviços Centrais
8. Instituto de Investigação Aplicada
9. Outro

5.4 Para qual ou quais departamentos presta os serviços referidos acima?

_____ (Pergunta aberta)

6. Por favor, indique o seu nível de escolaridade:

1. Licenciatura
2. Bacharelato
3. Mestrado
4. Doutoramento
5. Outra:

7. A que área pertencem os cursos que leciona? (Esta pergunta é para professores que responderam "sim" à pergunta 4)

1. Matemática e Ciências
2. Economia e Gestão
3. Ciências da Computação
4. Humanidades
5. Educação
6. Media e Design
7. Ciências Sociais e Direito
8. Saúde

QUESTÃO SOBRE A UTILIZAÇÃO DE IA

8. Utiliza tecnologias de inteligência artificial (IA) nas suas atividades profissionais?

1. Nunca usei
2. Usei algumas vezes
3. Uso ocasionalmente
4. Uso frequentemente
5. Uso regularmente

9. (Versão para investigadores e professores)

9.1 Para que utiliza a IA no seu trabalho? (Selecione todas as opções relevantes abaixo)

1. Para elaborar planos de aula
2. Para procurar novas ideias e tópicos para o conteúdo das aulas
3. Para procurar soluções didáticas e metodológicas
4. Para desenvolver tarefas individuais para cada aluno dentro do contexto do tema da aula
5. Para organizar a comunicação entre os alunos
6. Para explicar materiais
7. Para criar conteúdos multimodais (imagens, áudio e vídeo)
8. Para envolver os alunos em atividades de aprendizagem (quizzes, jogos de simulação, etc.)
9. Para motivar os alunos (comentários de apoio, lembretes)
10. Para avaliar os trabalhos dos alunos
11. Para analisar os dados sobre o progresso dos alunos
12. Para fornecer feedback aos alunos
13. Para controlo da assiduidade
14. Para gerir horários
15. Para reportar notas e tarefas
16. Para comunicar com os encarregados de educação
17. Para comunicar com a administração do Instituto Politécnico

10. (Versão para investigadores)

10.1 Para que utiliza a IA no seu trabalho? (Selecione todas as opções relevantes abaixo)

Para trabalhar com texto

1. Para escrever um texto
2. Para editar um texto
3. Para preparar comentários
4. Para rever um texto
5. Para traduzir texto
6. Para criar citações, links e listas de referências
7. Selecionar métodos de investigação
8. Recolher dados
9. Analisar dados qualitativos
10. Analisar dados quantitativos
11. Desenvolver ferramentas
12. Resumir resultados
13. Procurar conferências
14. Procurar revistas científicas
15. Escrever publicações em redes sociais
16. Preparar apresentações
17. Procurar ideias e hipóteses
18. Formular objetivos e metas
19. Rever abordagens científicas, teorias e conceitos
20. Explicar resultados
21. Realizar trabalhos escritos
22. Desenvolvimento profissional
23. Melhorar a comunicação

11. Como tomou a decisão de usar tecnologia de IA? (Escolha múltipla)

Redes Sociais

1. Li sobre as funcionalidades e benefícios em artigos, canais e blogues
2. Vi e/ou ouvi vídeos e áudios populares sobre a sua aplicação
3. Notei o crescente interesse pela IA entre líderes de opinião na educação
4. Vi um anúncio sobre IA
5. Vi referências ao uso da IA em materiais profissionais (artigos científicos, recomendações metodológicas, materiais analíticos, etc.)
6. Tomei conhecimento sobre a IA em comunidades profissionais (seminários, conferências, etc.)
7. Fui aconselhado por colegas
8. Fui aconselhado pelos meus alunos
9. A minha instituição introduziu a prática de usar IA
10. Participei num projeto-piloto sobre o uso de IA e avaliei o seu potencial
11. Tomei conhecimento de programas governamentais de apoio à implementação de IA e decidi aproveitar essas oportunidades
12. Participei numa formação que abordou a aplicação de IA
13. Outro

12. Selecione a afirmação que mais se aproxima da sua experiência com aplicações de IA para tarefas profissionais:

1. Não utilizo regularmente quaisquer aplicações de IA
2. Normalmente, utilizo apenas uma aplicação de IA
3. Normalmente, utilizo várias aplicações de IA
4. Normalmente, utilizo muitas vezes as mesmas aplicações de IA
5. Estou constantemente a aumentar o número de aplicações de IA que utilizo
6. É difícil dizer

13. Comparativamente com os seus colegas, quanto usa IA?

1. Acho que uso IA muito menos do que os meus colegas.
2. Acho que uso IA menos do que os meus colegas.
3. Acho que uso IA tanto quanto os meus colegas.
4. Acho que uso IA mais do que os meus colegas.
5. Acho que uso IA muito mais do que os meus colegas.

14. Na sua opinião, em que processos educacionais a IA poderá trazer maiores benefícios no futuro próximo?

Classifique as respostas por ordem de importância, sendo 1 a mais importante.

1. Domínio dos conteúdos
2. Desenvolvimento de competências sociais
3. Literacia digital
4. Aprendizagem inclusiva
5. Criação de materiais educativos
6. Avaliação de atividades de aprendizagem
7. Apoio metodológico e didático
8. Aprendizagem personalizada
9. Direção da Educação
10. Ensino à distância
11. Tomada de decisões baseada em dados
12. Outra (Descreva o processo após inserir o número 12 na resposta)

QUESTÕES SOBRE A REGULAMENTAÇÃO DA IA

15. Na sua área profissional, que normas/regulamentos sobre o uso de IA conhece?

[Escolha a que mais se adequa]

1. Sei que existem regulamentos sobre o desenvolvimento e implementação de IA ao nível governamental, regional ou municipal.
2. Sei que existem regulamentos específicos para o uso de IA na área da educação.
3. Sei que algumas organizações educativas têm os seus próprios regulamentos sobre o uso de IA.
4. Sei que existem regulamentos de IA ao nível dos departamentos e faculdades.
5. Nenhuma das anteriores

16. Como pensa que os princípios éticos para o uso da IA na educação devem ser implementados? (Escolha múltipla)

1. As decisões sobre os princípios éticos para a IA devem ser feitas ao nível legislativo.
2. As organizações educativas devem desenvolver e instituir princípios éticos comuns para a IA.
3. Cada organização educativa deve adotar os seus próprios princípios éticos para a IA.
4. Os princípios éticos para a IA devem ser adotados ao nível das faculdades e departamentos dentro das organizações educativas.
5. Os funcionários devem desenvolver os seus próprios princípios éticos para a IA.

17. De que formas pensa que os princípios éticos para o uso da IA na educação devem ser implementados? (Escolha múltipla)

1. É necessário fornecer aos funcionários regras éticas específicas e requisitos para o uso da IA.
2. É necessário fornecer aos funcionários uma lista de diretrizes éticas recomendadas para o uso da IA.
3. Os funcionários devem receber formação adicional sobre o uso ético da IA.
4. São necessárias mais discussões sobre a ética da IA na educação em conferências e reuniões.
5. Os grupos de investigação e educação devem poder desenvolver as suas próprias regras éticas para o uso da IA com base nos seus objetivos.
6. Os funcionários precisam de se educar sobre o uso ético da IA e tomar as suas próprias decisões sobre o uso da IA.

17. Por favor, classifique a importância de limitar a utilização da IA nos seguintes processos educativos.

Avalie numa escala de 7 pontos, em que 1 é absolutamente não importante e 7 é extremamente importante.

17.1. No processo de preparação para as atividades de aprendizagem.
1 2 3 4 5 6 7

17.2. No processo de aprendizagem.
1 2 3 4 5 6 7

17.3. No processo de realização de trabalhos de fim de curso.
1 2 3 4 5 6 7

17.4. No processo de avaliação de trabalhos e de fornecimento de feedback.
1 2 3 4 5 6 7

17.5. No processo de trabalhar com documentos.
1 2 3 4 5 6 7

17.6. No processo de tomada de decisões administrativas.
1 2 3 4 5 6 7

17.7. No processo de previsão e de prospeção de trajetórias educativas.
1 2 3 4 5 6 7

MODELO UTAUT2

Avalie numa escala de 7 pontos a sua atitude em relação às afirmações propostas, onde 1 – discordo totalmente, 7 – concordo totalmente.

Expectativa de Desempenho

PE1. Considero a IA útil na minha vida diária.
1 2 3 4 5 6 7

PE2. Usar IA aumenta as minhas hipóteses de alcançar coisas importantes para mim.
1 2 3 4 5 6 7

PE3. Usar IA ajuda-me a realizar tarefas mais rapidamente.
1 2 3 4 5 6 7

PE4. Usar IA aumenta a minha produtividade.
1 2 3 4 5 6 7

Expectativa de Esforço

EE1. Aprender a usar IA é fácil para mim.
1 2 3 4 5 6 7

EE2. A minha interação com IA é clara e compreensível.
1 2 3 4 5 6 7

EE3. Acho a IA fácil de usar.
1 2 3 4 5 6 7

EE4. É fácil para mim tornar-me competente a usar IA.
1 2 3 4 5 6 7

Influência Social

SI1. As pessoas que são importantes para mim pensam que devo usar IA.
1 2 3 4 5 6 7

SI2. As pessoas que influenciam o meu comportamento acham que devo usar IA.
1 2 3 4 5 6 7

SI3. As pessoas cujas opiniões valorizo preferem que eu use IA.
1 2 3 4 5 6

Condições Facilitadoras

FC1. Tenho os recursos necessários para usar IA.
1 2 3 4 5 6 7

FC2. Tenho o conhecimento necessário para usar IA.
1 2 3 4 5 6 7

FC3. A IA é compatível com outras tecnologias que utilizo.
1 2 3 4 5 6 7

FC4. Posso obter ajuda de outras pessoas quando tenho dificuldades a usar IA.
1 2 3 4 5 6 7

Motivação Hedónica

HM1. Usar IA é divertido.
1 2 3 4 5 6 7

HM2. Usar IA é agradável.
1 2 3 4 5 6 7

HM3. Usar IA é muito divertido.
1 2 3 4 5 6 7

Valor Percebido

PV1. A IA tem um preço razoável.
1 2 3 4 5 6 7

PV2. A IA oferece uma boa relação qualidade/preço.
1 2 3 4 5 6 7

PV3. Ao preço atual, a IA proporciona um bom valor.
1 2 3 4 5 6 7

Hábito

HT1. O uso da IA tornou-se um hábito para mim.
1 2 3 4 5 6 7

HT2. Estou viciado em usar IA.
1 2 3 4 5 6 7

HT3. Tenho de usar IA.
1 2 3 4 5 6 7

HT4. Usar IA tornou-se algo natural para mim.
1 2 3 4 5 6 7

Intenção Comportamental

BI1. Pretendo continuar a usar IA no futuro.
1 2 3 4 5 6 7

BI2. Vou sempre tentar usar IA na minha vida diária.
1 2 3 4 5 6 7

BI3. Planeio continuar a usar IA frequentemente.
1 2 3 4 5 6 7

Utilização

Por favor, escolha a frequência de utilização para cada uma das seguintes opções. Utilize uma escala de 7 pontos, em que 1 – nunca usei, 7 – usei várias vezes por dia.

a) Processamento de Linguagem Natural

(Reconhecimento, geração e processamento de discurso e texto escrito. Com a ajuda destas tecnologias, o discurso oral é convertido em texto escrito).
1 2 3 4 5 6 7

b) Visão Computacional

(Uso de IA para reconhecer informações visuais e gráficas. Esta tecnologia permite o reconhecimento facial (por exemplo, Face ID), câmaras de trânsito automatizadas).
1 2 3 4 5 6 7

c) Robótica e Automação

(Desenvolvimento e programação de tecnologias robóticas e configuração de processos realizados sem intervenção humana. Graças a estas tecnologias, alguns processos na produção ou noutras áreas ocorrem sem envolvimento humano).
1 2 3 4 5 6 7

d) Sistemas Especializados e Apoio à Decisão

(Tecnologias de IA treinadas em dados específicos para ajudar na tomada de decisões, fornecendo dados e análises. Estas tecnologias permitem que os especialistas tomem decisões mais rápidas e eficientes em várias áreas, fazendo recomendações específicas com base nos dados).
1 2 3 4 5 6 7

e) Assistentes Virtuais e Personalização

(Assistentes digitais capazes de interagir com humanos através de comunicação verbal e escrita. Têm a capacidade de compreender e interpretar comandos de voz e texto naturais, e realizar várias tarefas conforme os pedidos do utilizador).
1 2 3 4 5 6 7

f) IA Generativa

(Inteligência artificial usada para criar novos dados com base nas informações obtidas durante o treino. Estas tecnologias ajudam a criar novos materiais informativos: texto, imagens, vídeo, etc.).
1 2 3 4 5 6 7

Ansiedade em Relação à IA

Avalie numa escala de 7 pontos a sua atitude em relação às afirmações propostas, onde 1 – discordo totalmente, 7 – concordo totalmente.

Ansiedade de Violação de Privacidade

1. Tenho receio de que a IA monitorize o meu comportamento.
   1 2 3 4 5 6 7
2. Tenho receio de que a IA recolha demasiada informação pessoal sobre mim.
   1 2 3 4 5 6 7
3. As previsões da IA sobre as minhas preferências, como anúncios recomendados ou páginas web, fazem-me sentir que a minha privacidade está a ser violada.
   1 2 3 4 5 6 7

Ansiedade de Viés Discriminatório

1. É inaceitável que a IA apresente discriminação racial.
   1 2 3 4 5 6 7
2. A IA define preços diferentes (discriminação de preços) para diferentes pessoas, o que é injusto.
   1 2 3 4 5 6 7
3. A IA trata as pessoas de forma diferente, o que me deixa ansioso.
   1 2 3 4 5 6 7

Ansiedade de Substituição de Emprego

1. Preocupa-me que a IA substitua o meu trabalho no futuro.
   1 2 3 4 5 6 7
2. Sinto-me ansioso ao trabalhar com uma IA que é mais inteligente do que eu.
   1 2 3 4 5 6 7
3. Preocupa-me que a IA substitua o trabalho de muitas pessoas.
   1 2 3 4 5 6 7

Ansiedade de Aprendizagem

1. Não acho que seria capaz de ter um bom desempenho em cursos profissionais de IA.
   1 2 3 4 5 6 7
2. Compreender algoritmos de IA exige um elevado nível de talento, o que é difícil para mim.
   1 2 3 4 5 6 7
3. A tecnologia de IA atualiza-se demasiado depressa e é muito difícil de aprender.
   1 2 3 4 5 6 7

Ansiedade de Risco Existencial

1. A IA pode prejudicar humanos para alcançar um objetivo, o que me provoca ansiedade.
   1 2 3 4 5 6 7
2. Preocupa-me que o controlo da IA por algumas pessoas introduza grandes riscos para toda a sociedade.
   1 2 3 4 5 6 7
3. O desenvolvimento descontrolado de super IA reduzirá o tempo de existência da humanidade na Terra e pode até resultar na extinção humana, o que é terrível.
   1 2 3 4 5 6 7

Ansiedade Contra a Ética

1. Preocupa-me que a IA tenha sentimentos especiais (como amor ou adoração) por super IA.
   1 2 3 4 5 6 7
2. Incomoda-me que a IA possa enganar (por exemplo, levar as pessoas a comprar produtos).
   1 2 3 4 5 6 7

Ansiedade de Consciência Artificial

3. Preocupa-me que a IA atinja o mesmo nível de consciência que os humanos.
   1 2 3 4 5 6 7
4. O facto de a IA não conseguir distinguir entre humanos e ser consciente deixa-me desconfortável.
   1 2 3 4 5 6 7

5. A IA ter o mesmo nível de consciência que os humanos desafia o estatuto dos humanos, o que me deixa ansioso.
   1 2 3 4 5 6 7

ÍNDICE DE PREPARAÇÃO TECNOLÓGICA

Por favor, avalie até que ponto concorda com cada uma destas afirmações com base nas suas crenças. Utilize uma escala de **"Discordo Totalmente" a "Concordo Totalmente"**.

Otimismo

OPT1. As novas tecnologias contribuem para uma melhor qualidade de vida.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

OPT2. A tecnologia dá-me mais liberdade de mobilidade.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

OPT3. A tecnologia dá às pessoas mais controlo sobre as suas vidas diárias.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

OPT4. A tecnologia torna-me mais produtivo na minha vida pessoal.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

Inovação

INN1. Outras pessoas vêm ter comigo para pedir conselhos sobre novas tecnologias.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

INN2. Em geral, sou uma das primeiras pessoas no meu círculo de amigos a adquirir novas tecnologias quando surgem.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

INN3. Normalmente consigo perceber como funcionam novos produtos e serviços tecnológicos sem ajuda de outros.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

INN4. Mantenho-me atualizado com os últimos desenvolvimentos tecnológicos nas minhas áreas de interesse.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

Desconforto

DIS1. Quando recebo apoio técnico de um fornecedor de um produto ou serviço tecnológico, por vezes sinto que estão a aproveitar-se de mim por saberem mais do que eu.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

DIS2. As linhas de apoio técnico não são úteis porque não explicam as coisas em termos que eu consiga compreender.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

DIS3. Às vezes, penso que os sistemas tecnológicos não são feitos para serem usados por pessoas comuns.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

DIS4. Não existe um manual para produtos ou serviços tecnológicos avançados que esteja escrito de forma simples.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

Insegurança

INS1. As pessoas dependem demasiado da tecnologia para fazer coisas por elas.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

INS2. O uso excessivo da tecnologia distrai as pessoas a um ponto que se torna prejudicial.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

INS3. A tecnologia reduz a qualidade das relações pessoais ao diminuir a interação pessoal.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

INS4. Não me sinto confiante em fazer negócios com empresas que só estão disponíveis online.

1. Discordo totalmente
2. Discordo parcialmente
3. Concordo e discordo na mesma medida
4. Concordo parcialmente
5. Concordo totalmente

A ESCALA DE VALORES HUMANOS DO INQUÉRITO SOCIAL EUROPEU

Aqui descrevemos brevemente algumas pessoas. Leia cada descrição e pense no quanto cada pessoa é ou não é parecida consigo. Selecione a opção que mais se adequa e indique até que ponto a pessoa descrição é parecida consigo.

ESC1. Pensar em novas ideias e ser criativa é importante para ela. Gosta de fazer as coisas à sua maneira original.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC2. É importante para ela ser rica. Ela quer ter muito dinheiro e coisas caras.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC3. Considera que é importante que todas as pessoas no mundo sejam tratadas de forma igual. Considera que todos devem ter as mesmas oportunidades na vida.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC4. É importante para ela mostrar as suas capacidades. Ela quer que as pessoas admirem o que ela faz.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC5. Para ela, é importante viver num ambiente seguro. Ela evita tudo o que possa pôr em perigo a sua segurança.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC6. Gosta de surpresas e está sempre à procura de coisas novas para fazer. Acha que é importante fazer muitas coisas diferentes na vida.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC7. Acredita que as pessoas devem fazer o que lhes mandam. Acha que as pessoas devem seguir sempre as regras, mesmo quando ninguém está a ver.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC8. Para ela, é importante ouvir as pessoas que são diferentes dela. Mesmo quando não concorda com elas, quer compreendê-las.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC9. Para ela, é importante ser humilde e modesta. Tenta não chamar a atenção para si própria.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC10. Divertir-se é importante para ela. Gosta de cuidar de si própria.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC11. Para ela, é importante tomar as suas próprias decisões sobre o que faz. Ela gosta de ser livre e de não depender dos outros.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC12. É muito importante para ela ajudar as pessoas à sua volta. Preocupa-se muito com o seu bem-estar.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC13. Ser bem sucedida é importante para ela. Ela espera que as pessoas reconheçam os seus feitos.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC14. Para ela, é importante que o governo garanta a sua segurança contra todas as ameaças. Ela quer que o Estado seja forte para poder defender os seus cidadãos.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC15. Ela procura aventuras e gosta de correr riscos. Quer ter uma vida excitante.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC16. Para ela, é importante comportar-se sempre de forma correta. Ela quer evitar fazer qualquer coisa que as pessoas digam que é errado.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC17. Para ela, é importante obter o respeito dos outros. Ela quer que as pessoas façam o que ela diz.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC18. É importante para ela ser uma grande amiga para os seus amigos. Ela quer dedicar-se às pessoas que lhe são próximas.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC19. Acredita firmemente que as pessoas devem cuidar da natureza. Cuidar do ambiente é importante para ela.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC20. A tradição é importante para ela. Ela tenta seguir as tradições transmitidas pela sua religião ou pela sua família.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

ESC21. Procura sempre que pode divertir-se. É importante para ela fazer coisas que lhe dão prazer.

1. Muito parecido comigo
2. Parecido comigo
3. Como eu
4. Um pouco como eu
5. Não se parece comigo
6. Não se parece nada comigo

Agradecimento e Feedback

Muito obrigado pela sua participação neste estudo. Caso tenha interesse em receber os resultados e as principais conclusões, indique, por favor, o seu endereço de correio eletrónico.

_____ (Pergunta aberta)

APPENDIX 2. Cover letter for the questionnaire

Exmos.(as) Senhores (as)

Docentes e Investigadores,

Solicitamos, por este meio, a vossa colaboração no preenchimento de um questionário que visa recolher informações sobre a vossa experiência na utilização de aplicações de Inteligência Artificial.

Este questionário integra um estudo internacional que envolve Instituições de Ensino Superior de cinco países, entre elas o IPC. O trabalho original intitula-se *Exploratory Cross-Country Analysis of AI Adoption in Higher Education: Regulatory Frameworks, Cultural Influences, and Practical Applications in Polytechnic University of Coimbra*.

Este questionário faz parte do trabalho empírico de Dissertação do estudante Rodrigo Camões, aluno de Mestrado de Sistemas de Informação de Gestão, Instituto Superior de Contabilidade e Administração de Coimbra (ISCAC), sobre orientação das Professoras Verónica Vasconcelos (ISEC), Isabel Pedrosa (ISCAC) e Diana Koroleva (University of Naples Parthenope).

O questionário está disponível no seguinte link: https://tinyurl.com/253vwd4v e poderá ser preenchido até ao dia **11 de julho de 2025**.

Agradecemos antecipadamente a vossa participação.

Com os melhores cumprimentos,

Rodrigo Camões, Verónica Vasconcelos, Isabel Pedrosa, e Diana Koroleva

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