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Ethics and AI in Higher Education: A Study on Students' Perceptions

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Abstract. In this initial study, we explore the complex ethical concerns linked to implementing AI in education, focusing on undergraduates' perceptions of AI tools in their academic endeavors. A notable discovery is their substantial concern about educationally using these tools and the emerging need for robust public policies that protect ethics and privacy. Through qualitative research in an Information and Communication Technology course, we investigated the teaching of ethics for the use of AI tools in an academic environment. Our data indicates a trend of students toward using commercial AI tools not created specifically for educational use, suggesting a potential gap in the AI sector in education. This study highlights the need to promote critical thinking and the responsible use of AI tools in academic activities. However, more studies are needed involving higher education students and teachers to improve learning structures using AI tools.

Keywords: AIED, Ethical Insights, Education, ICT students

1 Introduction

Artificial Intelligence (AI) has been revolutionizing how we access information and interact with each other, catalyzing significant scientific advancements and aiding in achieving the United Nations Sustainable Development Goals (SDGs) by 2030. This revolution encompasses efforts towards fulfilling goal 4, which seeks to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" [13]. As AI integrates deeper into our social and cultural lives, exploring how it is influenced and shaped by human and societal values, especially in the educational sector, a domain inherently human, becomes imperative [5]. Integrating AI in the educational sector presents significant opportunities and challenges, requiring meticulous and comprehensive analyses [14,1].

Since the 1970s, AI has been introduced in educational settings, initially aiming to replace individual human tutoring - a highly effective teaching strategy,

but regrettably inaccessible for many [4,12]. At present, the convergence of Artificial Intelligence in Education (AIED) can be segmented into two main avenues: i) AI for Education, where AI assists in the teaching-learning process, benefiting students, teachers, and the educational system as a whole; and ii) Education for AI, focusing on developing the necessary values and skills to live and work with AI, encompassing both human and technological aspects of AI literacy [10,12].

However, the escalating proliferation of publications on AIED makes staying up-to-date challenging. Various literature reviews have endeavored to synthesize available information [21,7,3]. Concurrently, the emergence of AI tools like OpenAI's ChatGPT, Google's Bard, Meta's LIama, among others, has accelerated the integration of AI across sectors. However, many of these tools are not specifically targeted for academic use. This can give rise to various issues, including bias and plagiarism concerns, posing a potential risk to the educational process [20,11].

Artificial Intelligence in Education (AIED) is hailed for its ability to personalize learning and alleviate the workload of educators. However, it has also become a focal point of discussions concerning its ethical implications in the educational context, encompassing both the conscious integration of AI in teaching and the promotion of critical education adapted to the AI era. In 2019, a UNESCO study highlighted the "scarcity of systematic analyses on the effects of AI implementations in the educational sector" [19].

Recently, AI has permeated various sectors, prompting UNESCO to lead several studies fostering the responsible use of AIED. In 2023, the organization released guidelines for the application of Generative AI in Education [13]. Simultaneously, the growing literary output in the field has made it nearly impossible to keep up with recent advancements and discoveries. It has been noted that AI tools still face significant challenges in "interpreting" real-world information due to biases present in the data [13]. Thus, it becomes imperative that Information and Communication Technologies (ICT) students are fully aware when utilizing these solutions, as they are at the forefront of creating new tools and implementing these technologies in the development of innovative products and services.

Given this need to enhance the preparation of these students, our research seeks to answer the following central question: **"How does ICT students' familiarity with themes related to ethics and responsibility influence the use of AI, and what are their primary motivations and concerns when utilizing AI tools in their academic activities?"** With this study, we aim to provide valuable insights for researchers and educators about the elements encouraging ICT students to adopt AI tools. The selection of this demographic is strategic, as besides being current users of AI tools, they are destined to be the future developers of technologies that may incorporate AI, hence necessitating a deep understanding of the related challenges and impacts, including ethical and data privacy aspects [15,16,17,13].

This investigation, of a qualitative nature, was conducted through an online survey answered by 55 students enrolled in undergraduate Information Technol-

ogy courses at our institution. The study focuses on the analysis of the increasing adoption of AI tools in the academic environment. It is crucial to highlight that many of these tools were not initially created with a specific educational purpose. However, they have been widely adopted and integrated into learning environments by students, demonstrating a flexible adaptation and potentially signaling new opportunities and challenges for the educational sector. This study aims to contribute to the growing body of research on the responsible integration of AI into education, offering an insightful exploration of ICT students' motivations, concerns, and ethical considerations when utilizing AI tools in their academic endeavors.

The structure of this paper is organized as follows: In Section 2, we delineate the methodology employed in this research project. Subsequently, we succinctly summarize the responses garnered from the survey in Section 3. Following this, we engage in a comprehensive discussion on the findings derived from the survey in Section 4. To conclude, we present the final considerations of our study in Section 5.

2   Methodology

In this study, we adopted a qualitative approach, using structured research as the main data collection instrument [8]. The research team conducted the investigation with two first-year ICT classes at Fluminense Federal University.

This research was designed to address the main question presented in the introduction section, aiming to identify students' main motivations and concerns regarding the use of AI in academic activities. In this way, it is expected to provide insights for researchers and educators, contributing to the understanding of the factors that encourage students on ICT courses to adopt AI tools in their academic studies.

The questionnaire is made available online via the Google Forms platform from June 28th to July 4th, 2023. The mobilization for the research was carried out through a call sent via email to the student body.

To guide the data analysis and address the main research query, we formulated the following secondary research questions (SRQ), grounded in previous investigations: **SRQ1**: What is the frequency of use of AI tools among students who have received prior instruction in AI-related ethics? **SRQ2**: What are the most prevalent AI tools among students for the development of academic activities? **SRQ3**: What are the main motivations for students to employ AI tools in their academic activities? **SRQ4**: What are students' major concerns regarding using AI tools in their academic activities?

The research adhered to the ethical standards outlined in Resolutions 466/2012 and 510/2016 of the National Health Council of Brazil. Despite not undergoing review by an Ethics Committee, we requested participants to sign the Informed Consent Form to ensure the confidentiality and privacy of the collected data. Participants received detailed information about the study objectives and the responsible researchers, with a clear indication that the utilization of the data

would be for academic purposes only. Moreover, we guaranteed access to the study results in a suitable environment, implementing strategies to reduce fatigue and stress, without offering financial compensation. Participation was voluntary and free from any coercion.

3   Results

In this section, we present the findings from the qualitative survey organized according to the questions outlined in the methodology. The full results of this research can be accessed at the link: https://doi.org/10.5281/zenodo.10045454.

3.1   Demographic Profile and frequency of use of AI tools (SRQ1)

The survey was completed by 55 students (participants $P(1)$ to $P(55)$). The age range of the participants spanned from 17 to 26 years, with 29.1% being 18 years old. Of the total respondents, 78.2% are male, and 21.8% are female; more demographic details are provided in Table 1, which summarizes some responses about the participants' prior knowledge or perspectives on the research themes.

We have structured some questions related to understanding or studies before the date of this questionnaire that students may have studied on the topics of ethics and reconcilability and ethics and AI applied in ICT. We found that 61.8% of students participated in a subject that addressed the topic of ethics and responsibility, while 38.2% had not yet received guidance on the topic. Furthermore, we asked whether the students had been involved in discussions or participated in any course on ethical issues related to Artificial Intelligence. In this case, 52.7% stated that they had participated in such discussions, while 47.3% reported that they had not. When comparing participants who did not receive guidance on both questions, we observed that these correspond to 36.36%.

We conducted a comparative analysis between the students who indicated having previously studied ethics and responsibility or ethics and AI, cross-referencing this data with the declared frequency of use (shown in Table 1).

We present in Table 2, comparing data between students who studied "ethics and responsibility" or studied "ethics and AI" in some discipline in their undergraduate course or previous courses; this data was analyzed together with the categorical variables identified in "frequency of use of AI tools in academic activities" which ranges from never to always, presented in Table 1.

When analyzing the data in Table 2, we found that both the median and standard deviation (SD) are higher among students who have not yet studied these topics. This suggests that students who did not receive guidance on ethics and the use of AI tools have a higher frequency of using these tools. We noticed that students who previously studied these topics have a median score of 2, meaning a frequency equal to "rarely" used in the questionnaire. On the other hand, participants who did not study topics have a median of 3, denoting a frequency of "sometimes" according to the questionnaire scale, suggesting a greater frequency of use.

Table 1. Demographic information and related knowledge information

Description	Options	Quantity	Percentage (%)
Gender	Female	12	21.8
	Male	43	78.2
Age	17 - 20 years	35	63.7
	21 - 24 years	17	30.9
	25 - 28 years	3	5.4
Studied ethics and responsibility	Yes	34	61.8
	No	21	38.2
Studied ethics related to AI	Yes	29	52.7
	No	26	47.3
Frequency of use of AI tools in academic activities	Never	10	18.2
	Rarely	18	32.7
	Sometimes	16	29.1
	Frequently	10	18.2
	Always	1	1.8

We noticed in Table 2 that the standard deviation (SD) among participants who studied topics such as ethics and responsibility (SD = 0.994) or ethics related to AI (SD = 0.936) demonstrate similar centrality, but those participants who studied something about ethics and AI a slightly smaller dispersion, due to the results being very close. Meanwhile, those who did not study these topics present median and standard deviation with slightly greater dispersion.

Due to the small number of participants, we point out that the associated significance value, the p-value (p), is below 0.05, indicating that the distribution is abnormal. We also note that future studies need to perform other statistical analyses and increase the sample number to be sure of the statements considered in this study.

Table 2. Comparison between students' prior knowledge of the subject and their frequency of using AI tools.

Description	Answer option	Quantity	Median	Average	Standard deviation	Shapiro-Wilk p
Studied ethics and responsibility	Yes	34	**2**	2.6	0.994	**0.002**
	No	21	**3**	**2.95**	**1.024**	**0.004**
Studied ethics related to AI	Yes	29	**2**	2.31	0.936	**0.003**
	No	26	**3**	**2.77**	**1.107**	**0.001**

3.2   AI tools identified (SRQ2)

We formulated several questions to answer the initial research query and identify which AI tools the students used in their initial encounters with these tools in

their academic activities. Initially, we aimed to ascertain the frequency of AI technology usage in these activities. According to the responses collected, we found that 18.2% of participants claimed to never use AI tools; 32.7% reported rare usage; 29.1% stated they use them sometimes; 18.2% use them frequently; and a mere 1.8% asserted they always incorporate them into their activities. This information can be observed in Table 1.

To comprehend which AI tools the students had in mind when answering our survey, we posed the following question: **What are the most prevalent AI tools among students for the development of academic activities?**

We noticed that, despite the question focusing on academic activities, Chat-GPT was the most mentioned tool. This fact occurred even though this solution was not specifically designed for educational purposes or by education specialists. Among the AI tools mentioned by the students, ChatGPT stood out, receiving more than 21 mentions in the responses. Other tools include Elicit, Google Translator, GitHub Copilot, Symbolab, and an AI calculator[3]. However, many responses did not specify a particular tool but rather how the students use them. For instance, participant 12 described: "*I use AI to draft generic texts for my intended purposes, then I fill in with the information I need.*" Other students mentioned using them for programming activities, with statements such as *Correct codes*" (P14) or "*I used ChatGPT for academic consultations focused on programming*" (P15). And finally, we identified that 11 participants described no AI tools.

3.3   Reasons given by students for using AI in academic activities (SRQ3)

To gain deeper insight into the motivations that drive students to use AI tools in their academic activities, we crafted the following question in the dispatched questionnaire: **What are the main motivations for students to employ AI tools in their academic activities?** This understanding can assist educators and researchers in better steering the utilization process of AI tools in the teaching-learning process [6].

To better represent the responses from the students who participated in the survey, we arranged a categorization by thematic areas:

1. **Motivated by Practicality and Ease of Use**: Participants appreciate the ease and convenience of AI tools for automating simple tasks, such as "practicality and speed in completing a project" (P29).
2. **Encouraged by Time Savings and Automation**: Respondents value AI for its ability to save time when performing repetitive tasks, such as, for example, P49's observation that highlights some advantages that AI can offer, "superhuman speed in analyzing information and providing feedback to the user".

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[3] For example: Elicit and Symbolab are AI tools that can be applied in education, while the GitHub Copilot tool is a programming AI.

3. **Aid in Studies**: Students view AI as a study facilitator, serving as a "consultation tool to conduct scientific research" and assisting in mathematics-related disciplines (P15).

4. **Utilized for Writing, Reviewing, and Translating Texts**: AI is seen as a valuable tool to enhance the quality of texts and assist in translations, such as "improve the quality of written texts and assist in translating articles" (P16).

5. **Source of Information and Clarification of Doubts**: Some participants turn to AI to obtain quick information and clarify doubts, such as "objectivity to address a question on a subject I am not well-acquainted with" (P36).

6. **Support in the Workplace**: Some participants found utility for AI in the workplace, for example, P12 highlights AI's ability to "perform daily and repetitive functions autonomously, saving labor".

3.4   Main concerns presented by students regarding using AI in academic activities (SRQ4)

To assess whether students recognize potential negative repercussions associated with the use of AI tools in their academic activities, we proposed SRQ4. We noted that several participants were able to point out multiple negative aspects linked to the implementation of AI in the academic context in their responses. For instance, participant (P25) expressed: "Violation of academic ethics, given that improper handling of AI can result in ethical violations such as plagiarism, dishonest use of resources or incorrect attribution of others' work, in addition to a possible decrease in originality and creativity, since individual expression can be compromised." From the responses the students provided, we organized some categories that encapsulated the main critical concerns expressed.

1. **Authenticity and Accuracy of Information**: Some participants are uneasy about the possibility of AI generating false or inaccurate information, for example,"the lack of truthfulness in information is one of the issues that bothers me the most" (P5) .

2. **Plagiarism and Ethics in the Academic Use of AI**: There are fears that AI might facilitate academic ethical violations, such as plagiarism and dishonest use of resources, a concern highlighted, for example, by participant' (P25) who mentioned "violating academic ethics".

3. **The Diminution of Critical Thinking or Learning Skills**: Some fear that the use of AI might compromise the development of critical thinking skills, as exemplified in the speech of the participant (P1)(P46) (P54) who shows concern about the "loss of logical reasoning over the years".

4. **Dependence on AI**: There are fears that users might become excessively dependent on AI, a concern reflected, for example, in the quote from P4 "creating some kind of dependence or addiction in the consumption of its resources".

5. **Loss or Lack of Originality**: A participant expressed the concern that the use of AI might lead to a "lack of originality" (P27) (P8) (P25), potentially diminishing the ability to generate ideas and original works.
6. **Concerns About Privacy and Personal Data Security**: There are concerns about the security of personal information during the use of AI, with a participant highlighting "the security of my information" (P3) (P22) P26) as an area of focus.
7. **Concerns About Malicious or Inappropriate Use of AI**: Some participants are apprehensive about the potentially malicious use of AI and the loss of critical intellectual capacity, as evidenced by a response mentioning "malicious use" (P48) (P41).

4   Discussion

The expansive approach to data collection by AI systems, highlighted in studies such as [14], raises serious concerns regarding privacy and information ethics. This issue becomes even more pronounced when considering tools that do not primarily focus on education, underscoring the urgency for robust public policies. In this context, UNESCO emphasizes the importance of aligning educational AI initiatives with the development and implementation of solid public policies [13,12].

Our qualitative investigations endorse this viewpoint, indicating that a substantial fraction of students did not receive adequate guidance on ethics and responsibility within the realm of information systems and AI. As illustrated by the SRQ1 analysis and displayed in Table 2, participants who received proper initial guidance on these topics tend to use AI technologies more restrictively and exhibit a more pronounced critical stance on various issues explored in this study. Correlating the data shown in Table 1, we noticed that 36.36% of these students did not receive proper instruction or guidance on ethics and responsibility in both information systems and AI ethics. Our exploration of student perceptions regarding the use of AI tools highlights vital considerations to guide future pedagogical strategies and public policies. About SRQ2, we identified a deficit in the access and utilization of AI tools specifically designed for educational purposes in higher education. Instead, students tend to resort to commercial tools, such as ChatGPT, the use of which in the educational setting is a subject of debate [20]. The prominence of ChatGPT among respondents induces both enthusiasm and concern, given the potential implications of the early adoption of these technological innovations [6].

In the context of SRQ3, we explored the motivations driving students to use AI tools in academic activities. We found that usage extends beyond text revisions and answering queries, encompassing support for code development and as a facilitator in problem-solving, saving time - an observation backed by studies like [18,6]. The SRQ4 analysis revealed that many participants already harbor a developed critical sense, acknowledging that AI can have a mixed impact on learning. Concerns arise surrounding the diminution of critical ability, loss of

originality, misuse of data, and plagiarism. This scenario underscores the critical necessity to foster discernment regarding the reliability and ethical use of AI tools, and a concern also highlighted in recent works [13,17,6].

In conclusion, some students are already cultivating a critical and ethical stance towards the excessive reliance on AI. As pointed out by one of the respondents, there exists a tangible risk of placing undue trust in AI tools without adequately scrutinizing the generated information. This observation emphasizes the urgency to promote critical thinking in classrooms, equipping students to use AI tools consciously and responsibly [6,9,2].

5 Final considerations and future work

This study serves as a preliminary investigation, and further research is necessary, particularly expanding the scope to include postgraduate students, the perceptions of teachers, and professionals involved in developing AI tools for commercial use and education [7]. We recognize the need to develop monitoring and evaluation mechanisms to measure the impact of AI on education, teaching, and learning to provide a valid, robust, and evidence-based foundation for policy formulation. In future works, we plan to broaden the sample groups to encompass postgraduate students and teachers, aiming to understand better how they are utilizing AI tools in their activities, as well as the dynamics of the guidance being given by teachers to students regarding the use of AI tools in various activities.

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