

ETHICS OF USING AI FOR ACADEMIC RESEARCH AND PLAGIARISM

Andrei-Stelian ANGHEL²

Dragos-Cosmin ION³

Larisa-Mihaela PETROIU⁴

Tudor-Octavian SELEA⁵

Cătălin TUDOSE⁶

Costin-Anton BOIANGIU⁷

Abstract

This study article aims to increase awareness regarding the utilization of Artificial Intelligence (AI) in academic work and its resulting influence on the issue of plagiarism. The study seeks to provide insight into the existing patterns and methods of using AI in academia by analyzing data from a wide range of students. The purpose of this work is to make a substantial contribution to the continuing discussion on the role and impact of AI, highlighting the need for careful consideration and ethical guidelines to navigate the complex landscape of AI-assisted academic endeavors.

Keywords: Artificial Intelligence, academic, plagiarism, ethics, guidelines

JEL Classification: C61

1. Introduction

The evolution of mankind has always been facilitated by discoveries and innovation. The invention of the wheel, in the 4th millennium BC, the discovery of electricity by William Gilbert in 1600, and the invention of the telephone by Alexander Graham Bell in 1875, all

² Student, POLITEHNICA National University for Science and Technology of Bucharest, Romania

³ Student, POLITEHNICA National University for Science and Technology of Bucharest, Romania

⁴ Student, POLITEHNICA National University for Science and Technology of Bucharest, Romania

⁵ Student, POLITEHNICA National University for Science and Technology of Bucharest, Romania

⁶ PhD, Lecturer, POLITEHNICA National University for Science and Technology of Bucharest and Luxoft Romania, Romania, catalin.tudose@gmail.com

⁷ PhD, Professor, POLITEHNICA National University for Science and Technology of Bucharest, Romania, costin.boiangiu@cs.pub.ro

form the basis on which humankind has developed and paved the way for discoveries and groundbreaking inventions, the latest one having the potential to change the world as we know it: Artificial Intelligence.

Artificial Intelligence (AI) is known as the simulation of human intelligence in robots that are built to function and think like humans. Artificial Intelligence can make decisions, learn from mistakes, and carry out operations that normally call for human intelligence [1].

The undeniable impact of Artificial Intelligence on our lives is clear. AI methodologies such as machine learning, deep learning, and artificial neural networks are revolutionizing the way data is being processed and analyzed. Furthermore, autonomous and semi-autonomous systems are experiencing growing use across several industries, including healthcare [2], transportation [3], and production [4].

Various tools based on Artificial Intelligence help programmers write more efficient and clean code [5][6], help bloggers write more intriguing, attractive, and complex articles [7], and even generate new innovative ideas, which can help people start new businesses or lead them to discoveries [8]. Artificial Intelligence can enhance the learning experience by analyzing individuals' weaknesses, strengths, and learning styles to tailor a customized strategy, ultimately improving the overall learning outcome.

But with great power comes great responsibility. The principles and notions that should guide the advancement and use of Artificial Intelligence have caused extensive debate due to its powerful transformative impact and substantial influence in various societal domains. Recent scientific research and media coverage has primarily focused on the concerns of AI's capacity to eliminate human employment [9], be exploited by malicious individuals, avoid responsibility, and unintentionally propagate bias, thus compromising justice [10].

Academia is a significant arena for exploring the accomplishments and difficulties linked with Artificial Intelligence (AI), building on the basis outlined above. The incorporation of AI in academic environments involves not only an expansion of its technological capacities but also an examination of its ethical and societal consequences.

The potential of AI to customize educational experiences [11] is significant. AI can personalize educational content based on the distinct learning patterns of each student, thereby adapting to their own requirements and strengths. This has the potential to result in enhanced learning outcomes and a transformative shift in educational practices.

AI technologies possess the capacity to efficiently process extensive quantities of data, beyond the effectiveness of conventional methods [12]. In the context of academic research, this can lead to accelerated and more precise outcomes, empowering researchers to derive profound understandings and conclusions that were previously unreachable due to the complex nature or magnitude of the data.

Plagiarism and academic integrity [13] are a highly debated issue in the field of AI in academia. Artificial intelligence tools, such as sophisticated writing aids, can help create work that blurs the boundaries of authorship. This prompts worries regarding the authenticity and ethical utilization of AI-generated information in academic endeavors.

2. Prior Research

The use of AI tools such as ChatGPT by students and the impact this technology has is a topic of great interest, especially in the scientific community. There are already a large number of articles [14] that highlight the fact that Large Language Models and other AI-powered tools could be both a blessing and a curse for humanity. While using these mechanisms helps when it comes to productivity, many are concerned that overreliance on these tools might have a drastic effect on the critical thinking of those who use them. After the New York City Public Schools decided to ban the use of ChatGPT by its students, a spokesperson stated that: “While the tool may be able to provide quick and easy answers to questions, it does not build critical-thinking and problem-solving skills, which are essential for academic and lifelong success”

One article that focuses on the limitations of ChatGPT and its impact on academia and libraries [15] states that “One of the main limitations is that GPT models are based on a statistical approach that learns patterns from a large data set of text, which can perpetuate biases and stereotypes present in the data. This means that the model may generate offensive or harmful output. Additionally, GPT models are not able to fully understand the context and meaning of the text they generate and they are not able to perform well in tasks that require common sense reasoning or logical reasoning which is not covered in the training data”. This article concludes that while the benefits of using AI are notable and desirable by students, ethical considerations such as privacy and bias have to be taken into account: “ChatGPT has considerable power to advance academia and librarianship in both anxiety-provoking and exciting new ways”.

Another article [16] focused on the role of Artificial Intelligence in academic writing, and the authors believe that when it comes to scientific writing, ethical concerns could limit the use of AI tools such as chatbots. Humans incorporate what they have learned from others as well as their own ideas in the process of creating new articles. Individuals are therefore prone to repeating the conclusions, statements, and written works of others, and thus come dangerously close to committing plagiarism by presenting an idea without properly citing the original writers.

AI or ChatGPT systems can commit plagiarism under this definition but can also be programmed to avoid copying others by rephrasing their work like what human authors do. However, using programs to reformulate sentences and writing to reduce the percentage of plagiarism (i.e., asking the software to rewrite a section written by other authors with

different words) could not be considered acceptable in scientific research. If we define “plagiarism” as a mere act to copy someone else's work, just rephrasing what was written, regardless of the method used, and without adding anything personal, it is a violation of academic integrity. For this reason, journal editors should use programs to detect written content using AI to detect plagiarism better.

Moreover, the lack of an expert and critical human mind behind scientific work (which is the basis of the scientific method) could lead to a risk of perpetuating or amplifying existing biases and inaccuracies in the data, providing unfair results and hampering scientific growth.

A recent study [16] regarding journal editors’ beliefs about the ethicality of using ChatGPT/AI tools for publishing concluded that AI tools are acceptable under specific circumstances. After conducting a series of surveys, they identified the fact that tasks such as summary writing, writing computer code, and editing text using AI tools are mostly considered acceptable. Any tools that are particularly useful for analyzing or processing data or aiding in the final writing/editing stages of the research process are regarded as suitable, but the editors also highlight the importance of disclosing AI use as is customary for any methodological procedure or tool.

3. Conducting the Survey

The method used to collect data for this study was through a survey, which was distributed mostly to computer science students from various institutions but also to high school students and people who work in the field of IT. This approach ensures a broad range of responses and perceptions on the addressed subject. This work aimed to gather diverse and comprehensive insights, reflecting the varied experiences of participants concerning the topic under study. By doing so, we were able to capture a wide spectrum of views and opinions, highlighting the distinct experiences of the participants within the context of the theme addressed.

A response system consisting of only "Not at all, Rarely, Sometimes, Often, Always" was used. It represents a Likert scale [17] which is highly valued in surveys for its ability to reliably measure unobservable constructs and its flexibility in response options, ensuring high internal consistency and adaptability across various research contexts. Continuous advancements in its development have further enhanced its accuracy and utility in modern research.

The survey consisted of a series of questions that were categorized into three distinct segments, each focusing on certain elements.

The objective of the initial segment (Demographics and Familiarization with AI) is to collect demographic data and evaluate the respondents' level of acquaintance with Artificial

Intelligence (AI). Contextualizing the responses within the particular educational and age demographics, the study takes into account the age group, academic year, and kind of institution. Furthermore, evaluating the level of familiarity with AI helps in comprehending the existing knowledge and comfort of responders with AI technology. Understanding their perceptions and interactions with AI in an academic setting is of the highest importance.

The objective of the second section is to examine and evaluate the utilization and consequences of Artificial Intelligence in the field of research. This section attempts to comprehend the scope and method by which AI tools are included in academic practices. The objective is to find out the frequency and categories of AI tools used in academic research and activities. The survey seeks to get insights into the practical implementation of AI in academia by asking about the frequency of AI tool usage for different academic goals, such as data analysis, and its impact on research efficiency. In addition, this section examines the level of knowledge regarding ethical concerns such as plagiarism when utilizing AI-generated content. This helps to gain a more comprehensive picture of the responsible use of AI in academic work.

The third section is specifically focused on examining the ethical implications and awareness related to the utilization of AI in educational environments. It evaluates the frequency at which ethical considerations about the usage of AI, specifically in the instance of ChatGPT, are taken into account, and the extent to which these ethical problems are discussed in academic contexts. This section explores individuals' perspectives regarding the influence of AI on academic writing abilities, as well as their level of trust in the accuracy and reliability of AI-generated content for academic use. The objective is to evaluate the level of ethical awareness and comprehension regarding the possible consequences and constraints of AI in academic research.

Each of these topics is essential for obtaining an in-depth understanding of the use, influence, and ethical implications of AI in academic environments. The collected responses will help in identifying gaps in knowledge, possible domains for more training, and strategies to encourage responsible and ethical utilization of AI in academia.

4. Results and Analysis

We will now examine the gathered data, seeking noteworthy patterns, interesting correlations, and any other relevant concerns. We will also attempt to analyze and make sense of this data within the wider context of ethical considerations surrounding the utilization of artificial intelligence in academic research.

During this study, we obtained a significant level of participation, shown by the active involvement of 101 individuals who offered their answers to the questionnaire.

A majority of 43,5% of the respondents self-identified as "Beginners" in the field of Artificial Intelligence. This indicates that although they are Computer Science students, a significant number do not consider themselves advanced in AI knowledge.

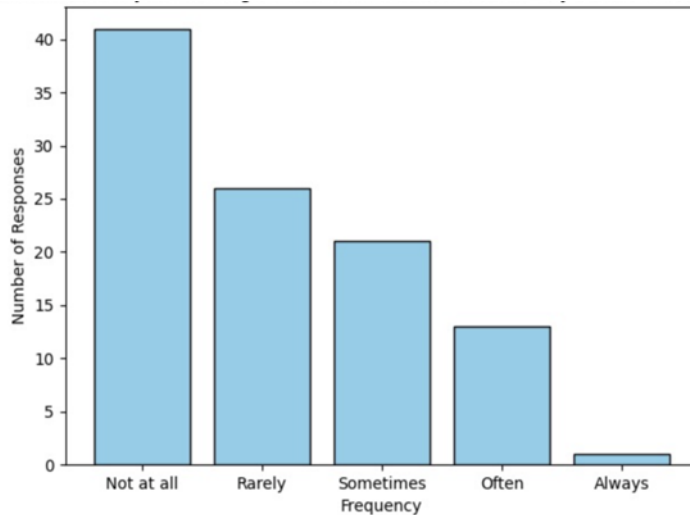


Figure 1. When using AI-generated information or content, how often do you cite it as a source in your academic work?

As shown in Figure 1, a significant proportion of respondents (41 out of 101) indicated that they do not cite AI-generated information or content at all in their academic work. This response suggests a potential risk area for plagiarism or a lack of clarity regarding academic rules for citing AI-generated sources.

Regarding the question, "How often do you consider the ethical implications of using ChatGPT in your academic work?", the responses showed a relatively even distribution across various levels of concern. Notably, "Sometimes" emerged as the most common response, with 34 out of 101 respondents selecting it. This outcome indicates a varying degree of awareness among individuals about the risks and ethical considerations associated with the use of AI, like ChatGPT, in academic research contexts.

In response to the question, "How often do you consult your institution's policies on the use of AI in academic research?", it was found that a significant majority, constituting 33.66% of respondents, do not consult their institution's policies at all. This suggests a scenario where there is either a low level of awareness about these policies among researchers or a lack of concern for adhering to formal guidelines when utilizing AI in academic research.

Addressing the query, "How often do you use AI tools to analyze or interpret data in your research?", the gathered data reveals a notably high frequency of AI tool usage among

respondents. Specifically, 32.67% reported using AI tools often in their academic endeavors, while 31.68% indicated they use them sometimes. This pattern suggests that AI tools are a significant component in the academic activities of the respondents, encompassing a range of tasks from research to other academic-related functions.

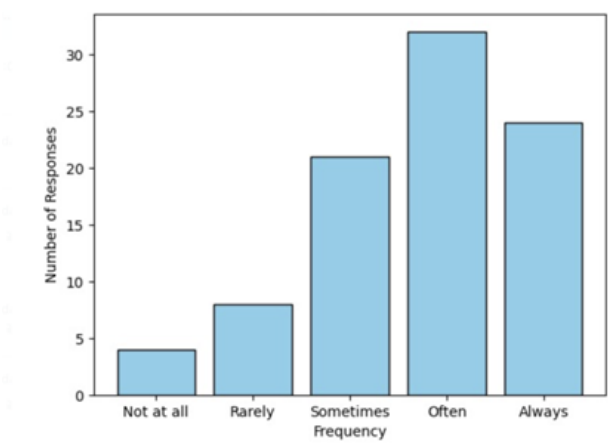


Figure 2. How often does using AI make your research process more efficient?

Figure 2 highlights a significant insight regarding the perceived efficiency of using AI tools among respondents. Specifically, 26% of them consider themselves to be always more efficient when utilizing AI tools, and a further 36% believe they are often more efficient with these tools. This data suggests that a majority of the respondents perceive a notable increase in their work efficiency when incorporating AI tools into their tasks, emphasizing the need for awareness about the various implications associated with the use of such technology in their work.

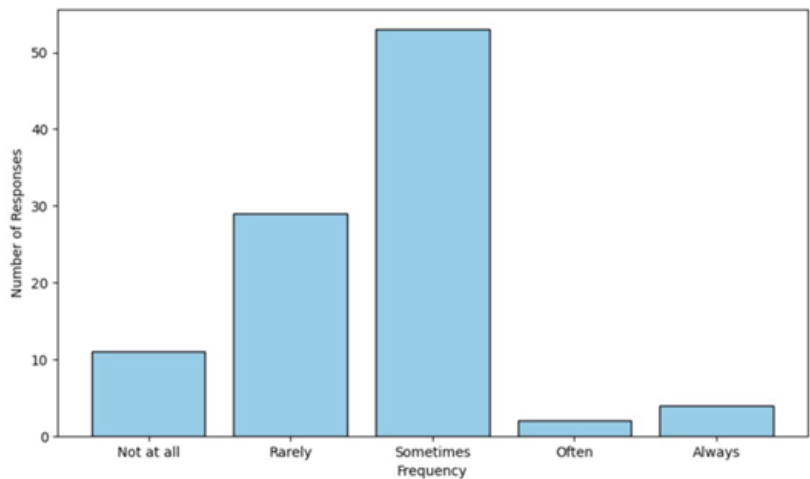


Figure 3. How often do you feel confident in the accuracy and reliability of content generated by AI language models for academic purposes?

Figure 3 shows that 46% of respondents sometimes feel confident in the accuracy of the content generated by AI language models for academic purposes, while 29% are rarely confident and 7% have no confidence at all. This finding is particularly concerning, especially when considered in conjunction with the results from the previous question. The juxtaposition of the majority of respondents using AI tools and believing in their efficiency, against the backdrop of having little to no trust in the content produced by these tools, suggests a possible over-reliance on using these AI tools without adequate trust in their output.

As highlighted in the survey question about awareness of plagiarism issues when using AI-generated content in academic work, most respondents acknowledge this problem. Specifically, 36% are always aware, and 33% are often aware of plagiarism concerns. However, it's noteworthy that 31% of respondents still lack awareness of the issues associated with using AI-generated content in academic contexts. This indicates a need for more focused educational efforts to enhance understanding among students and academics in this area.

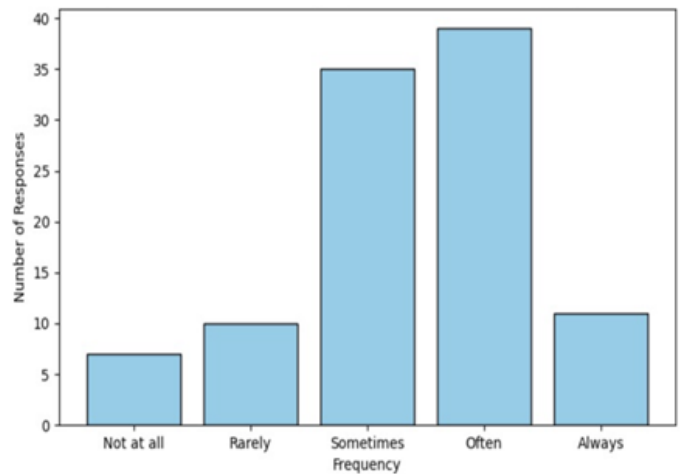


Figure 4. Do you think using AI language models to the quality of academic research?

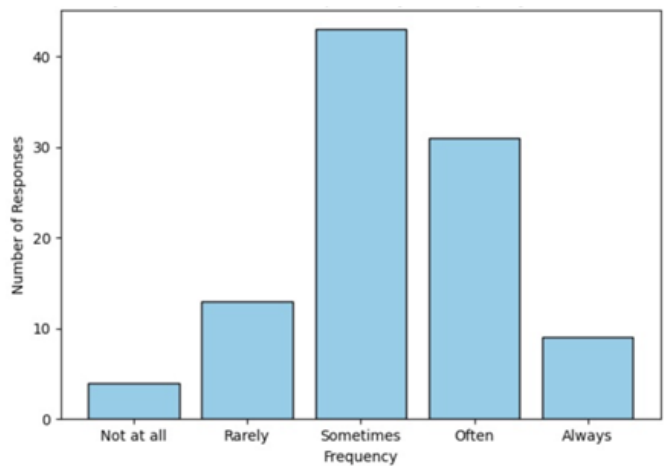


Figure 5. Do you think AI contributes positively contributes to academic plagiarism?

Figure 4 presents the responses to the question regarding the contribution of AI language models to academic plagiarism. The majority of respondents, 40 out of 101, believe that the use of AI language models often leads to academic plagiarism. This suggests a heightened awareness among students about the potential of AI language models to produce content that could be misused for academic plagiarism.

Figure 5 addresses the question of AI's positive contribution to the quality of academic research. A considerable number of students, 32 out of 101, responded that AI often enhances the quality of academic research positively. This response demonstrates that students recognize the advantages AI can offer in academic settings. However, when

considered alongside the responses from the previous question, it seems that students may be overlooking the ethical challenges in favor of the positive outcomes. This dichotomy emphasizes the importance of educating students about the ethical use of AI in academic research.

Regarding the question, "Do you discuss with colleagues the ethical use of AI language models in academic research?", the majority of respondents, comprising 48 out of 100, indicated that they rarely or never engage in discussions about the ethical use of AI language models in academic research. This points to a notable lack of interest or awareness among a significant portion of the students concerning the ethical implications of utilizing AI in academic settings. It suggests that other aspects, such as workload or achieving academic goals, are given higher priority, overshadowing the importance of understanding and addressing the ethical dimensions of AI use in academic research.

5. Conclusions

The survey findings reveal a critical need for increased awareness, education, and discussion surrounding the ethical utilization of artificial intelligence in academic settings, specifically with the appropriate referencing of AI sources and the avoidance of plagiarism. Furthermore, it emphasizes the necessity of establishing a balance between embracing AI technology and maintaining strict academic standards, specifically regarding promoting research and critical thinking abilities. Educational institutions need to establish explicit protocols and encourage transparent dialogue regarding the ethical and moral utilization of AI. This will guarantee that technology is employed in a manner that enhances academic integrity rather than compromising it.

Ultimately, the information collected indicates an increasing recognition of the ethical dilemmas and potential dangers of plagiarism linked to the utilization of artificial intelligence in academic research. Nevertheless, there is a lot of potential to further improve the education and guidance provided to students and researchers regarding optimal practices in this field. This emphasizes the need to incorporate AI ethics into the academic curriculum and the necessity for clearly defined norms for the conscientious utilization of AI technologies in education.

Appendix

Except for the first 5 questions, the mean and standard deviation are calculated by attributing a value in the range [1, 5] for each answer: Not at all = 1, Rarely = 2, Sometimes = 3, Often = 4, Always = 5.

Question	Mean	Standard Deviation
What age group do you fall into?	21.48 (years)	2.63 (years)
What year of study are you currently in?	3.09	1.35
What type of higher education institution are you studying at?	Public University	-
How familiar are you with Artificial Intelligence (AI) fields?	Intermediate to Beginner	-
What AI tools do you use?	ChatGPT	-
When using information or content generated by AI, how often do you cite it as a source in your academic work?	2.29	1.06
How often do you use AI tools in your academic activities?	2.4	1.26
How often do you consider the ethical implications of using ChatGPT in your academic work?	2.4	1.16
How often do you think the use of AI for academic research undermines the learning process?	2.14	1.02
How often do you consult your institution's policies regarding the use of AI in academic research?	2.31	1.13
How often does the use of AI make your research process more efficient?	3.07	1.23
How often is the topic of AI ethics and its use in academic research discussed in your academic environment?	2.37	1.02

Question	Mean	Standard Deviation
How often do you feel you fully understand the capabilities and limitations of AI language models in the context of academic research?	2.41	1.12
How often do you use AI tools for data analysis or interpretation in your research?	2.17	1.05
How often do you believe that reliance on AI language models impacts the academic writing skills of students or researchers?	2.52	1.05
How often do you feel confident in the accuracy and reliability of content generated by AI language models for academic purposes?	2.24	1.06
How often are you aware of plagiarism issues when using content generated by AI tools in academic work?	2.64	1.17
How frequently do you believe that the use of AI language models contributes to plagiarism in the academic environment?	2.13	1.01
How frequently do you believe AI positively contributes to the quality of academic research?	2.13	1.02
How frequently do you find yourself relying on AI tools to complete academic or research tasks?	2.21	1.06
How frequently do you believe that the use of AI language models affects the development of critical thinking skills in the academic environment?	2.2	1.01
How frequently do you discuss with colleagues the ethical use of AI language models in academic research?	2.31	1.06

Question	Mean	Standard Deviation
How frequently has your approach to conducting academic research changed due to the availability of AI tools?	2.23	1.02
How frequently are you concerned about the potential misuse of AI language models in academic research?	2.15	1.04

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