ARTIFICIAL INTELLIGENCE: A LOOK BACK TO THE FUTURE IN UNIVERSITY EDUCATION

MOHSEN ABBASI, MICHAEL MAKS DAVIS, RAFAEL MELGAREJO HEREDIA, and DIEGO ANTONIO ORDÓÑEZ CAMACHO

Center for Experimental Science and Innovation, International Faculty of Innovation PUCE-Icam, Pontifical Catholic University of Ecuador, Quito, Ecuador

The year 2023 marked a significant advancement in artificial intelligence, but the education community was not necessarily prepared for the introduction and use of new software such as ChatGPT, Adobe Generative Fill, Stable Diffusion, and others. AI could be asked to write essays, plan project work, or simply keep students’ company through long hours of solitary study. The question remains, is AI the enemy educators should resist, a colleague that should be encouraged to facilitate student learning, or where is the space to be occupied somewhere between the two extremes? In this context, the research seeks to go beyond knowing whether and how students are using AI, to begin to understand why they use it as they have done throughout 2023. A semi-structured survey was carried out with the public including students and teachers from different faculties and disciplines from all around Ecuador, who had found AI coming into their professional. The insights from the survey will be compared between each other and with published material with bottom-up experiences that were felt at a student level. The impact will be that we will be able to assess where, how, and why we will operate over the coming years.

Keywords: Advancement, Generative, Embrace, Benefits, Concerns, Engagement, Data security, Ethics, Governance, Algorithms.

1 INTRODUCTION

Educators and students alike were taken by surprise when, in 2023, AI programs such as ChatGPT, Adobe Generative Fill, Stable Diffusion, and others, entered the internet by storm (Prabani et al. 2022). They were suddenly exposed to a form of AI that could interact with its users (Xu et al. 2021), be asked to write essays, and plan project work (Aragon et al. 2023) and even provide a form of company in the long hours of solitude meeting a deadline can entail (Fréjus et al. 2022).

This study aims to go beneath the surface and find the underlying motivations driving professionals, teachers, and students to use artificial intelligence (AI) tools in their academic endeavors in an era where the lines between technology and education are constantly becoming more blurred. The rising accessibility of AI technology to both students and educators has led to a need for a comprehensive knowledge of the underlying factors that drive its adoption into education (Rodzi et al. 2023). The ability to comprehend information has the potential to contribute to policymaking (Chhillar and Aguilera 2022), facilitate the development of creative solutions (Das and Varshney 2022), and improve the overall educational experience (Allam et al. 2023). The findings will be paired with previous studies that investigate the potential of ChatGPT in improving academic advising in higher education (Akiba and Fraboni 2023) and the utilization of it in education to augment engagement and deliver immediate feedback (Ilieva et al. 2023).
Furthermore, it is worth exploring the implications of Generative Artificial Intelligence (GAI) in the field of education (Bahroun et al. 2023), with particular emphasis on the ethical considerations that arise. The present paper is organized in the following manner: The problem that prompted this study is discussed in section 2, while the research questions that guided this investigation are presented in section 3. Subsequently, section 4 emphasizes the significance of the study, detailing its prospective contributions to educational practices and AI incorporation. Section 5 describes the employed methodology, including survey design and data collection procedures. Section 6 analyzes the collected data to obtain an in-depth understanding of the perspectives and behaviors of the participants in relation to AI adoption. The results and their implications are discussed in section 7, which also offers a lucid interpretation of the findings. The paper concludes in section 8 with a summary of the key findings and suggestions for educators, policymakers, and AI developers in the educational domain. The investigation of the implications of the broad employment of AI technology in the context of education is of greatest significance as it continues to advance and becomes more readily available to students and instructors. Gaining insight into the underlying motives and rationales that drive individuals to use AI technologies into their academic endeavors is crucial for informing policy decisions, developing impactful treatments, and improving the overall educational experience. This study seeks to address the following key problems: “How and why are students, instructors, and other professionals utilizing AI tools in their fields of study and work? What are the perceived advantages, disadvantages, and repercussions of such AI integration, particularly in education?”

2 STUDY METHODOLOGY

This study employs a semi-structured online survey that makes use of a survey platform with free sections for participants’ comments and additional information. The selection of questions was made with the intention of ensuring simplicity, precision, and inspiration, in order to minimize the occurrence of incomplete survey responses. The significance of obtaining thorough responses in surveys was shown to outweigh the emphasis on soliciting numerous specific replies. The selection of the commenting sections was made with the intention of gathering more information from individuals who demonstrate sufficient interest. A video that explains the research, its significance, why we need their assistance, and the benefits for the participants was created. This video was intended to and did motivate visitors to fill out the free and optional comment fields, which yielded the most valuable data. The movie was promoted on the social media platform TikTok, with the intention of reaching individuals of all genders who possess an interest in education, as well as professionals from all other sectors. However, it should be noted that the video was specifically targeted at those aged 16 and above. The focus of the initiative was directed at the geographic region of Ecuador, with a particular emphasis on those who are proficient in both Spanish and English languages. In light of this statement, it is important to note that all individuals who took part in the survey did so on a voluntary basis, without any kind of selection or influence.

Regarding the data analysis, the survey responses were carefully analyzed to obtain a comprehensive understanding of the participants’ attitudes and behaviors regarding the adoption of AI in education. The analysis employed both qualitative and quantitative methods to gather insightful information. The first stage of the study consisted of a demographic analysis where the 83 participants who filled out the survey were classified into three categories based on their demographics: students, teachers, and other professionals. The distribution was investigated further to determine the proportion of each group within the sample. Then, the participants’ responses to question 2 were analyzed, which inquired about the academic disciplines in which they used AI tools. To determine the prevalence of AI adoption across various academic domains,
the percentages of respondents employing AI in different disciplines were calculated. Next, the responses to question 3 were analyzed to determine the specific purposes for which respondents employed AI tools. Calculated percentages were used to determine the most prevalent purposes among respondents. The responses to question 4 were then analyzed to determine the most popular AI tools and the causes for their popularity. Utilizing qualitative analysis, the reasons were categorized into common themes, providing valuable insight into the motivations of the participants. Following this, the qualitative survey responses were subjected to thematic analysis to comprehend the participants’ perspectives on the integration of AI in education. To obtain a deeper understanding of the advantages, disadvantages, and consequences of AI use, common themes, and patterns were identified. Finally, the examination of the data seeks to provide a comprehensive overview of the survey's findings, providing valuable insights into the patterns and trends in AI adoption among students, instructors, and other academic professionals from a variety of disciplines.

3 RESULTS

The results of this study, based on an analysis of the survey responses, cast light on numerous facets of the adoption of AI in education. At this point a summary of the results can be found. Further details and graphs can be found in the Annexes. 39% of the 83 respondents were students, 18% were teachers, and 43% belonged to other professional domains, according to the survey. This distribution ensured a diversity of participants, enabling an in-depth understanding of AI adoption across all positions. 38% of respondents in the Engineering area use AI tools for various objectives, the greatest adoption rate among academic disciplines. The Administration area followed closely behind, with 18% of respondents using AI for administrative tasks. Other areas, such as Natural and Precise Science, Human Science, and Education and Pedagogy, also reported substantial AI adoption, each accounting for a sizeable proportion of respondents. Regarding the purposes of AI utilization, most participants (25%) utilized AI tools for text processing. Information Gathering and Data Analysis ranked second and third, with 22% and 18% of respondents, respectively. Other notable applications included image creation or manipulation (12%) and programming and code creation (13%). With respect to the preferred AI tools and reasons for this, among the students who responded to question 4, ChatGPT emerged as the most favored artificial intelligence (AI) tool, with several participants citing its usefulness for providing information and assisting with tasks. Some students also mentioned utilizing ChatGPT to overcome algorithmic obstacles and obtain project development guidance. Meanwhile, teachers and other professionals have reported using ChatGPT and other AI tools such as Bard, Adobe Generative Fill, and others to assist with time management, inspiration, and the automation of repetitive tasks. Furthermore, the feedback received from both students and teachers about the utilization of artificial intelligence technologies in the context of education offers valuable insights into the potential implications of utilizing AI techniques in this domain. For example, numerous students reported employing AI technologies such as ChatGPT to facilitate the process of locating information, condensing text, or comprehending intricate terminology. Additionally, several students have observed that the utilization of AI tools such as DALL·E and MidJourney enhances their creative thinking abilities and aids in the visualization of ideas. In terms of gaining support in academic tasks, students, particularly those pursuing technical disciplines, reported utilizing AI tools to aid with activities such as rectifying programming code errors, providing project instructions, and producing research content. Moreover, the students acknowledged the significance of AI technologies such as ChatGPT in augmenting the role of human academic counselors. These tools offer easily available information and assist students in initiating inquiries. With relation to time efficiency, numerous
students indicated that AI technologies offer timesaving benefits across a range of activities, including information retrieval and text summarization. Meanwhile and from the educators’ point of view, several reported utilizing AI technologies to aid in various duties such as time management, text composition, data analysis, and virtual support. Finally, the diversity of AI tools was highlighted by students as well as teachers, encompassing a range of options such as ChatGPT, DALL·E, Bard, Bing, and several more. Overall, the thematic analysis of qualitative responses provided valuable insights into the perspectives of participants on the incorporation of AI in education. Most respondents were optimistic, emphasizing AI’s capacity to optimize workflow, enhance creativity, and provide beneficial assistance with a variety of academic duties. Some participants admired AI’s capacity to generate content and effectively structure texts. A small percentage of respondents, however, were concerned about the potential negative effects of AI adoption, such as an overreliance on AI tools leading to a decline in critical thinking and creativity. They have expressed worries over the potential for AI to encourage passiveness or spread incorrect data.

4 DISCUSSION

The results of the study provide an extensive understanding of AI adoption in education among students, instructors, and other professionals. Diverse perspectives and motivations for AI use highlight the need for balanced incorporation of AI tools in educational environments. The integration of artificial intelligence techniques in the field of education has the potential to yield several benefits, including expanded access to knowledge, heightened levels of creativity and productivity, higher efficiency in academic activities, enhanced advising capabilities, time optimization, and increased assistance for teachers. AI systems have the ability to provide assistance to teachers in a range of administrative and instructional tasks, therefore possibly alleviating their workload. AI has the potential to improve the accessibility of educational materials and boost the efficiency of information retrieval for students. It has the potential to enhance creativity and support students in producing academic content for their study or research. AI tools have the potential to be highly beneficial resources for students, assisting them in efficiently accomplishing their academic responsibilities. They also have the potential to assist students in enhancing their time management skills, hence potentially augmenting their total productivity. Chatbots, particularly ChatGPT and ChatGPT+, have become widely utilized for a range of purposes, with their performance being deemed acceptable (Ilieva et al. 2023) to high (Akiba and Fraboni 2023). Third, the Incorporation of AI into the field of academic advising has the potential to enhance educational equity, particularly for students who may have limited availability of high-quality advising services. Nevertheless, it is important to acknowledge apprehensions regarding excessive dependence on artificial intelligence and guarantee that consumers possess a comprehensive understanding of the constraints associated with these technological instruments. The application of AI tools in research efforts involves several activities, including data analysis and content development. This implies that AI has the potential to contribute to the progress of educational research and innovation. The presence of diversity in AI technologies suggests that there exists a variety of capabilities that may effectively address diverse educational demands and preferences. The presence of such variety should be used for comparative analysis, therefore minimizing the reliance on a single source that may potentially provide inaccurate or misleading information (Akiba and Fraboni 2023). The concerns voiced by students, instructors, and their thoughts on the challenges associated with the usage of AI tools highlight the need of educating users with knowledge about the potential and limitations of artificial intelligence systems together with pointing out ethical concerns. In order to address and minimize these potential threats, the
European Parliament has dedicated significant efforts over the course of several years towards the formulation and advancement of the AI Act that defines principles and stipulations governing the advancement and implementation of AI technologies, with a notable concentration on encouraging the ethical and transparent utilization of AI systems (Ilieva et al. 2023). Given all of the above, it is imperative that the next research endeavors place attention on the establishment of ethical principles and governance frameworks to effectively tackle concerns pertaining to data privacy, bias, and transparency (Bahroun et al. 2023). What this issue necessitates is the establishment of comprehensive ethical principles and governance structures to facilitate the incorporation of AI, rather than outright prohibition. The term "concern" underscores the significance of acknowledging and tackling ethical and practical problems in the use of AI and specifically the General Artificial Intelligence (GAI) in the field of education. In general, AI has the capacity to revolutionize several facets of education through its ability to offer significant assistance to both students and instructors.

5 CONCLUSIONS

ChatGPT is a popular tool among students, instructors, and other professionals, as indicated by the responses to the survey. AI is utilized in numerous academic disciplines, with Engineering and Administration areas heading the way in AI integration. Participants use AI tools for diverse purposes, including text creation, data analysis, and information gathering. The study revealed that AI integration received generally positive feedback, with participants appreciating its potential to boost productivity and facilitate learning. This study provides valuable insights into the adoption of artificial intelligence in education, highlighting both its opportunities and challenges. Educators can effectively utilize AI's potential to improve the learning experience if they perceive the motivations and perspectives of participants. Moreover, there is a definite need to educate and train students and educators in the use of AI. Finally, it is clear that we are at the gates of a new era: AI penetration in education, and the consequences are not foreseeable with the naked eye.

References


