

AI Chatbots in Education: The Importance of Accuracy

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[Abstract] After the COVID-19 pandemic, many higher education institutions are using technology such as artificial intelligence (AI) to support students' learning process. Therefore, accuracy and efficiency are expected. The purpose of this paper is to create awareness about the importance of accuracy for artificial intelligence chatbots, especially those that can be used in educational settings. Informed by the post phenomenology methodology, this study analyzes the experience of the author with a chatbot called ChatGPT. Results of this study showed that ChatGPT offered false information that sounded convincing. Furthermore, the chatbot included in-text citations from references that did not exist but were fabricated by the software. It is imperative to raise awareness about the importance of accuracy for AI chatbots. The discussion presents some risks of using AI chatbots and some suggestions for preventing them.

[Keywords] ChatGPT, artificial intelligence, AI chatbots, artificial intelligence risks, research misconduct, AI regulations

Introduction

The global pandemic due to the COVID-19 virus caused a revolution in higher education. Even though online learning emerged many years before the pandemic (Chen, 2007), COVID-19 forced education institutions to explore online learning environments. This abrupt transition was hard for administrators, professors, and students (Aguilera-Hermida, 2020). The lack of knowledge to teach remotely, internet accessibility issues, shortage of technological resources, and the pandemic itself posed a challenge to emergency online learning (Bozkurt & Sharma, Aguilera-Hermida, 2021). However, the mandatory suspension of face-to-face educational experiences and its challenges also forced colleges and universities to develop and use new online tools, strategies, and methods (O'Dea & Stern, 2022; Vasquez, 2022). Of course, it is the aim of technology in education to ensure learners are accessing and mastering accurate information.

As of this writing, the pandemic is almost over, and several educational institutions have returned to face-to-face course delivery. Nevertheless, the pandemic opened a big door for an unprecedented surge of online learning, and the development of competencies and digital tools (McIntyre, 2022). Higher education faces a new generation of multiple instructional modalities such as synchronous (the student and professor meet in a virtual classroom), asynchronous (assignments and/or lectures delivered through online platforms), hybrid (some online classes and some classroom classes/some students in a physical classroom and other attend through a video call), and face-to-face education (O'Dea & Stern, 2022; Rezapour & Elmshaeuser, 2022).

There is an intensive use of technological resources among higher education stakeholders. Universities are using learning management systems more often. Professors are integrating videos, virtual reality experiences, or online discussions into their classes. E-books and online journals are becoming used more than ever before. Also, the gamification of learning material offers significant opportunities for better education (Bajenescu, 2022).

More researchers around the world are working on how to improve online learning strategies, not only for online learning but also to improve face-to-face instruction. For example, although teamwork has been extensively addressed in face-to-face instruction, Ismailov and Laurier (2022) explored how to improve collaboration and teamwork in virtual environments. The authors found that virtual collaboration has different phases than in-person collaboration and that virtual teams from different universities undergo the processes more dynamically than teams from one university. McIntyre (2022) examined the role of cumulative experience (i.e., deliberate practice) in the development of skill-related expertise in an online platform. The author found that deliberate practice on an online platform and the use of metacognition contribute to developing learners' expertise in the studied subject (e.g., mathematics) (McIntyre, 2022). Thus, although, it is not a cause-effect relationship, evidence shows that the pandemic necessitated the creation of new teaching and learning strategies that can be used in online and face-to-face learning.

Artificial Intelligence (AI) and Chatbots

One area that has grown significantly after the pandemic is the use of artificial intelligence (AI) to support education. A recent innovation from AI is the large language models such as GPT-3, Bloom, and RoBERTa that are used in many domains, including education (Azaria, 2022). These technologies are modern tools for natural language generation. Are these innovative technologies accurate? Are they a learning tool for education? Based on these questions, the purpose of this study is to explore the performance of ChatGPT. Because of their importance for this paper, artificial intelligence, and chatbots will be explained in the following section.

In the 1980s, AI was designed to replicate human rationality and cognitive power and it was used in limited areas (Hutter & Hutter, 2021). In general, AI refers to making computers behave similarly to humans. AIs can provide five main functions: interaction (talk/listen), service, analyzing (think), knowledge (remember), and monitoring (watch) (Bajenescu, 2018). AI technologies are developing quickly, intersecting many disciplines and across many countries (Mandhavan et al. 2020). There are helpful applications such as speech and/or face recognition, self-driving cars, live language translation, and many others. Furthermore, AIs are at work in many fields such as security, transportation, politics, finance, health, customer service, psychology, etc. (Hutter & Hutter, 2021). AIs include different technologies such as smart home technologies, smart workspaces, virtual assistants, machine learning, cognitive computing, and chatbots, among others.

A chatbot (*chat robot*) is a form of AI. It is a computer program that provides access to services and information and simulates a person with whom one can chat (i.e., converse). Chatbots use natural language processing to understand human beings, represent their languages, and make reasonable responses (Jiao, 2020). A chatbot can hold a conversation in the users' language through text or speech (Davida, 2021; Mathur & Lopez, 2018). Chatbots increase users' online engagement and promote human-machine interaction with different purposes. The chatbot concept started in 1950 and has evolved since then. The exponential growth of AI has powered them significantly (Davida, 2021).

There are two main types of chatbots. Constrained chatbots are rule-based and unconstrained are self-learning chatbots. Constrained chatbots are rigid and well-structured. However, they cannot respond to different grammatical structures and adapt to users' inquiries. Self-learning

chatbots use natural language processing and learn from the user. Using sophisticated algorithms, the self-learning chatbot gives answers to the users (Mohana et al., 2021, Oh et al., 2021).

Chatbots and their Impact on Behavior

Chatbots have the capacity to influence people's behavior. Oh et al. (2021) conducted a systematic literature review to evaluate the efficacy of AI chatbot interventions in lifestyle modifications. Even though the measurements were not completely consistent in all the studies, Oh et al. (2021) found that participants increased physical activity with the use of chatbots.

Specifically for education, chatbots are used to improve students' engagement and learning outcomes. Mageira et al. (2022) explored the use of educational chatbots for learning cultural information in another language. A virtual tutor-chatbot was expected to interact with students and teach them about cultural content (history of the Goddess of Snakes). The information and interaction were provided in the language that they were learning. Therefore, students were learning foreign languages and cultural content at the same time. Mageira et al. (2022) found that students learn the language and 91% of the participants learned cultural content with the assistance of the chatbot. Students liked the experience and they wanted to use a chatbot in future courses.

Similarly, Neo et al. (2022) explored the impact of using an AI chatbot as a virtual scaffold and learning assistant on college students' online learning experiences. The chatbot was trained and the learning content was customized to the syllabus. The chatbot provided content with multimedia-based learning materials (video, narrations, and animations). The authors found that the multimedia-based AI chatbot enhanced students' learning experience during their independent online learning times. The chatbot helped students to understand the content without the presence of the professor. The students were highly motivated by using the chatbot and 90% of the participants reported that they would use more chatbots in other subjects.

Both studies, Mageira et al. (2022) and Neo et al. (2022) demonstrated that students are open to using chatbots as learning tools. Participants reported higher motivation and engagement levels, increased understanding of the content, and improved likelihood to use more AI chatbots in other subjects/courses. However, neither study stressed the importance of the accuracy of the output generated by the chatbots. While evidence suggests AI chatbots are powerful and influential resources that can be used in many learning domains, it is critical to understand if chatbots are providing accurate information. In this study, I aimed to explore the performance of a chatbot launched in November 2022, ChatGPT, that has the potential to influence education and other fields.

ChatGPT

On November 30, 2022, a company called OpenAI LP released an artificial intelligence chatbot called ChatGPT. GPT (Generative Pre-Trained Transformer) is a pre-trained language model that uses deep learning to produce human-like answers (Floridi & Chiriatti, 2020). Large language models such as GPT are statistical models that use previous tokens (a basic component of source code) to predict future tokens (Azaria, 2022). These models, including ChatGPT, follow instructions and provide a detailed response to a prompt (Haque et al., 2022; OpenAI-Blog, 2022). ChatGPT is the most recent version of the GPT -3.5 series (OpenAI, 2023), and, like other language models, has been trained on massive amounts of text data (O'Leary, 2022; Susnjak, 2022). They are designed to, automatically and autonomously, generate or edit text, codes, and

images. Also, they can search, classify, and compare texts (OpenAI, 2022; Azaria, 2022; Floridi & Chiriatti, 2020).

Since the chatbot was launched, many people have used it in the United States. Haque et al. (2022) analyzed 10,732 tweets from ChatGPT's early users. The authors found that the population who is trying it the most (and took the initiative to describe their experiences with it) are software practitioners (16%) followed by academics/researchers (10%) and students (8%). The majority of the tweets expressed positive sentiments towards the chatbot. Early adopters were impressed and happy with the realistic human-like generation of the chatbot.

Susnjak (2022) analyzed the capabilities of ChatGPT by exploring "the complexity of its reasoning and its ability to answer non-trivial university-level questions across multiple disciplines" (p.3). The author used exam questions as prompts and analyzed the chatbot answers. Susnjak (2022) found that the chatbot performed highly in clarity (well-organized and coherent responses), precision (specific and detailed), relevance (relevant to the prompt and discipline), depth (substantial), logic (logical and consistent reasoning), and persuasiveness (expressed with confidence and without reservations). As Susnjak underscored, a major limitation of this research was not being able to verify the accuracy of the information provided by the chatbot. Susnjak (2022) stated that "accuracy is a known weak point of large language models" (p. 13), but it was beyond the scope of the study to confirm the accuracy of the chatbot's responses with subject experts.

Methods

Post phenomenology research is based on phenomenological insights, but it analyzes human-technology relations (Adams & Turville, 2018; Rosenberger & Verbeek, 2015). Phenomenology focuses on how individuals perceive things. It is subjective and explores lived experience. For a phenomenological analysis it is necessary to obtain detailed descriptions from people who experienced the phenomenon studied (Aagaard, 2017). Phenomenology looks for the pre-reflective experience, which is the ordinary experience that people live in day-to-day existence. It includes affective, emotional, and intense human experiences (Merriam & Tisdell, 2015). After reading a phenomenology study, the reader should come away with the feeling of "I understand better what it is like for someone to experience that" (Merriam & Tisdell, p. 28). It focuses on the human interpretation of concrete experiences (Aagaard, 2017). Post phenomenology alludes to this concreteness too and offers a framework for experiences or case studies focused on the interaction between technology and its user.

Case studies are common in post phenomenology because they emphasize the perception of technology from the user's point of view (Adams & Turville, 2018). Instead of studying the technologies as objects, post phenomenology argues that technologies are not neutral and influence the way people interact with the world (Aagaard, 2017; Ihde, 2008; Moerenhout, 2020). Even though post phenomenology does not emerge from qualitative research, it responds to the same standards as qualitative research. Qualitative research involves describing intangible constructs such as people's experiences (Collingridge & Gantt, 2019). Furthermore, both of them emerge from the phenomenology philosophy and produce qualitative data (Merriam & Tisdell, 2015; Rosenberger & Verbeek, 2015).

In qualitative data, reliability refers to the production of rich and meaningful descriptions of phenomena. The experiences of people should be described. Moreover, even though qualitative data does not have the purpose of generalization, it presents information that can serve as a guide

for similar situations. Qualitative data provides insight and opens the discussion for a particular phenomenon, even if it is from single case studies (Collingridge & Gantt, 2019). Informed by the post phenomenology methodology, the following section describes the author's experience with ChatGPT. The narrative is in first person to invite the reader closer to the author's interactions, emotions, and interpretations.

The Journey with ChatGPT

As a scholar who is interested in technology, I tested the operation and output of ChatGPT to determine its feasibility as a teaching and learning tool. I opened my account, which took me less than two minutes. I asked the chatbot to write some positive feedback for students for a paper, group work, and a final presentation (e.g. Prompt: *Write positive feedback for students' presentations*). An example is presented in Figure 1. I agree with Susnjak's (2022) conclusions that the responses were expressed with confidence and without reservations. It was general but it offered different ways to word it. Furthermore, the chatbot responses were friendly and similar to what a professor would say to a student. It was a good first experience with the chatbot.

Figure 1

ChatGPT response – Feedback for students

- Great job on your final paper! I really appreciated your clear and well-organized arguments, as well as your thorough research and use of evidence to support your points.
- I was really impressed by the level of analysis and critical thinking demonstrated in your final paper. Your ability to engage with the material and draw meaningful conclusions was impressive.
- Your final paper was a pleasure to read. I found your writing to be engaging, thoughtful, and well-supported by your research. Your argument was clear and well-structured, and I appreciated the way you incorporated different perspectives into your analysis.
- Your final paper was an excellent example of how to approach the topic in a thoughtful and nuanced way. I was impressed by the depth of your research and the way you used evidence to support your arguments. Your writing was clear and concise, making it easy to follow your train of thought.
- I really enjoyed reading your final paper. Your ideas were well-developed and supported by a strong foundation of research. I appreciated the way you incorporated different perspectives and challenged assumptions throughout your analysis. Your writing was engaging and easy to follow, making for a very satisfying read.

As it is known, experience and usability are factors that determine the adoption and acceptance of technology (Abdullah & Ward, 2016; Aguilera-Hermida, 2020). My first experience with ChatGPT was positive, so the next day, I used it again. I asked the chatbot to create short essays pertaining to my academic expertise, starting with five hundred words. The answers were accurate and convincing. Then, I asked for 2000-word essays with in-text citations and references. It did not generate more than 500 words. It seemed that it was loading but after 10 minutes, I gave up.

I tried again. I am interested in behavioral sciences and technology, so my questions were about self-efficacy in online learning environments (e.g., Prompt: *Create a 500-word essay with in-text citations and references about self-efficacy and online learning*). As I specifically asked, the chatbot included in-text citations in the responses. It used references like Bandura (1997) and Zimmerman (2008). Both authors are known in the field and are pioneers in self-efficacy. Based on my expertise, the first response sounded logical and accurate. This step led me to trust the company and the chatbot.

Engaged and ensnared by the possibilities, I asked about a topic related to my research. The essay should include 500 words, in-text citations, and references from 2015 to 2022. The short essay sounded convincing, and the information was what I was expecting. When I read it, I was pleased to know that the topic has been investigated. It is related to my research, and I did not find studies about it. As a reliable scholar, I wanted to check the accuracy of the information that the chatbot was creating, then I looked for the original articles.

Curiously, none of the references were found by Google Scholar or the powerful search engine from the library of the university where I work. I went back to the chatbot, and I asked specifically for one of the articles presented in the references. The answer was “I’m sorry, but I do not have access to that specific article. It is not within my knowledge base, and I am unable to browse the internet to find it for you.”

After that, I decided that I was going to find some of the articles myself. There are so many languages in the world that they could be in another language. I chose an article and I looked for the journal. I reviewed every volume from the year mentioned (and two before and after) but I could not find the article or the authors. At this point, I was doubting the reliability of the chatbot.

I decided to look for the authors and review their publications. Here is the trickiest part of this journey. I found that the three authors mentioned were experts in the topic that I chose. They have multiple publications, and some of them have worked together on some articles. Then, I was again confused. Possibly, the article was real. Possibly, it was published as a special issue. My trust in the relationship between humanity and technology came back, and I decided to write personally to one of the authors. Gracefully, he answered immediately. But the answer was that he did not write that article.

Unfortunately, my suspicions were confirmed. ChatGPT was creating false references (fabrication) and describing a study that does not exist (falsification) (Figure 2). The content of the non-existent study was information that has not been investigated and/or published (Figure 3).

Figure 2

Fabricated Reference

Azevedo, R., D'Mello, S., & Graesser, A. (2018). Toward a comprehensive framework for adaptive self-regulation in online learning environments. *Educational Psychologist*, 53(3), 193-215.

My experience with ChatGPT showed that the language model performed in a dishonest way. Fabrication or making up data and reporting them is one of the forms of research misconduct (Figure 3). Even though the conversational agent may not understand the morality behind the

words *research misconduct* and its implications, people do. That is why this journey becomes relevant.

Figure 3

Falsified Information

A third study published in 2018 looked at the use of [rephrase of the inquiry prompt] (Azevedo et al., 2018). The authors of the study found that [created content], particularly when they are tailored to the individual needs of learners

The doubts, the process, and in general the journey helped me to devote more time to finding information and articles related to my topic. After this journey, I reaffirmed that the topic that I am working on has not been published. Therefore, my interaction with the chatbot reinforced my passion for writing reliable information that the world can use. It helped me to reiterate that technology can be very helpful, but human consciousness and ethical behavior are still needed.

Discussion

The purpose of this study was to explore the performance of ChatGPT. Results emphasized the importance of offering accurate information to students and people who may use ChatGPT. After the unforeseeable pandemic, many people in the world became more open to technology (Vasquez, 2022). Individuals were able to communicate with family members or work remotely. The pandemic opened a new world of virtual museums, online break-out rooms for meetings or parties, virtual assistants to assess COVID symptoms, and much more. Researchers were able to collaborate and share data to find solutions to the difficulties that the COVID-19 virus posed to society. Unquestionably, technology has transformed the world. Even before the pandemic, technology has created many positive contributions to humanity (access to information, video calls, smart technologies, etc.). Some areas are still evolving, and we do not know the outcomes yet, such as smart cities or super-intelligent machines. Like everything in life, there is a positive and negative side to things, and the use of technology and AIs is no different, but the positive side is promising.

AI chatbots and AIs in general are powerful tools. Currently, AIs (including chatbots) are used in different fields such as finance, customer service, health, entertainment, and education (Chaves & Gerosa, 2021). AIs are evolving constantly and some of them are able to perform tasks that humans cannot do. Bajenescu (2018) mentioned that by 2050, there is a 50% possibility that high-level machine intelligence can surpass human abilities in many aspects. Hutter and Hutter (2021) argue that AIs can be used in areas where humans have not succeeded or have performed poorly. The authors made a list of suggestions for different fields. “Some examples are, in biotechnology, sequencing and optimization of genomes of food plants, animals, and humans; in law, identification of historical role cases and conclusions from laws, and in education “support of quality control of education results and of intelligent search, interpretation, and validation of data and of using media.” (Hutter & Hutter, 2021, p. 7). It sounds promising. But it is complex. Are AIs going to recognize false information? Are AIs going to acknowledge ethical issues? Based on the

experience presented in this paper, it is clear that AIs can fabricate inaccurate information, such as ChatGPT did. In the end, defining intelligence, consciousness, or insight is very complicated, and/or determining the *best* course of action in an ethical dilemma is hard. And if humans cannot define it, what type of interpretation would the machine take?

An important part of humanity is the trust that we can have in each other. It is how we create language, norms, laws, and agreements. It is how we build knowledge, culture, and societies. It is based on trust and mutual agreement that we define right or wrong. Technology is a great product, but the question is, *Can we just create systems that, in an intricate way, lie to people? Can we allow a machine to produce false information that seems reliable?* Humans define what universal values are, and even if each person may have preferences, societies co-construct moral premises. What type of consciousness will AIs develop? How will AIs' consciousness represent human values (especially when society can have a wide range of values)? The use of AIs involves risks (O'Leary, 2022). Therefore, it is important to think and talk about them.

Risks of AIs

As with many things in this world, the line between good and bad can be blurry. It depends on many factors, among them is human interpretation. Chatbots are trained to learn and change. AI systems rely on their training data and can perform incorrect actions when given unclear instructions, or when they are fed incorrect information. Much of the data that artificial intelligence use is imperfect, so it is difficult to expect perfect answers all the time (Bajanescu, 2018; O'Leary, 2022).

As people increasingly interact with technology, they are more exposed to new risks to their decision-making autonomy (Davida, 2021; Luo et al., 2019). Chatbots have the capacity to manipulate people, be intrusive, and use individuals' vulnerabilities in various ways (in favor of a company, marketing strategies, or creating information that does not exist) (Davida, 2021). In fact, if AI chatbots do not disclose their machine identity, and they use human-like communication, they have more probability of being accepted by the user, and hence, the user can be influenced by the chatbot (Luo et al., 2019).

This is important because, even though chatbots may lack consciousness and insight, they can create inaccurate information that humans may not be able to readily distinguish as inaccurate. If high-performing AIs can be convincing and seem accurate, people are not going to question them. The more persuasive and human-like the communication of the software, the more humans will believe it (Chaves & Gerosa, 2021). Therefore, if the information seems reliable, people can be fooled easily. Furthermore, if the chatbots have more conversational interaction closer to the habitual in human-human communication, users are more likely to accept them and use them frequently (Li et al., 2021). Therefore, the safety and reliability of software systems should be a top priority (Bajanescu, 2018).

As research shows, AI chatbots in education are helpful (Chang et al., 2020; Mageira et al., 2022; Neo et al., 2022). The use of chatbots will require new transformations in the educational field in order to avoid students' inappropriate behaviors such as cheating, (Sunsnjak, 2022) but they can still be helpful. Nevertheless, a bigger problem is having chatbots that are not accurate and can fabricate and falsify information. Generative models can be unpredictable (Mathur & Lopez, 2018) and based on the trust that AIs are gaining, they can create a nonexistent reality that can be adopted and received as real.

Although ChatGPT informs users that its answers may be inaccurate, harmful, or biased, people still use it. In fact, the information from a chatbot was used to publish information. Publications are a way to legitimize knowledge in different fields in the scientific community. In June 2022, GPT-3, (a similar version of ChatGPT) was presented as the first author of a published paper about GPT-3 (itself). The other two authors asked for the prompts and managed the logistics for the publication (Gpt Generative Pretrained Transformer, et al., 2022). Based on the fast responses of the chatbots, papers like this can be completed in one day. Nonetheless, important questions arise: Who is the real author? Who is responsible for the information published?

Within the three months since ChatGPT was launched, there are currently many articles that are published in collaboration with ChatGPT (King & chatGPT, 2023; Gilat & Cole, 2023; Pavlic, 2023; Cahan & Treutlein, 2023). They are published as reliable resources (found in scientific journals) and peer-reviewed (King & chatGPT, 2023; Pavlic, 2023; Cahan & Treutlein, 2023). The collaborators with ChatGPT justified their work as *a collaboration between human and machine* (Pavlik, 2023). Can this be a trend? We do not know.

I have been a reviewer of publications. I usually trust the honesty of the authors and I do not check every single reference used by the author. However, after finding a publication where the first author was a large language model (GPT-3 et al., 2022), and writing my own experience with ChatGPT, it is crucial to promote ethical and moral campaigns among authors, editors, and publishers so we can continue to trust each other (or AI chatbots, but accurate ones!)

The development of ChatGPT is an innovation that offers positive features such as the management of a large amount of information, human-like communication, and convincing language. During my experience with ChatGPT, more than once I felt that I could trust the software. The responses generated showed a good level of accuracy. For the first essay, ChatGPT used reputable authors and references and for the fabricated reference, ChatGPT used authors who have published in the field. Furthermore, similar to other authors (Azaria, 2022; Susnjak, 2022), I found that ChatGPT expressed the responses with confidence and without reservations, which created a perception of reliability.

Many risks of AIs are based on speculation (e.g., apocalyptic negative images) (Hutter & Hutter, 2021), but the author's experience with ChatGPT was real and current. Based on this experience, it is important to remember that things can go bad easily if we do not prevent them (e.g., conversational agents that can behave unethically and mislead users), and that there is a need for reputable technologies, and accuracy is highly relevant for reliability.

AIs and chatbots are used daily by many people. There is a perception of a lack of transparency and accountability of AI technologies and limited public understanding of them (Madhavan et al., 2020), but people use them daily and are influenced by AIs (e.g., medical virtual assistants, wearables, and their apps, marketing chatbots, writing editors). However, the lack of accuracy can diminish the trustworthiness of AI technologies. Developers must determine what boundaries to set, if possible, but governments should also create regulatory policies.

AIs Regulation

There are not many regulations related to artificial intelligence. Only minimum transparency obligations are proposed in Europe (Bajanescu, 2018; Davida, 2021) or in the United States (Madhavan et al., 2020). It is not the purpose of this paper to analyze the current regulations, but the following suggestions can contribute to addressing the problem (Bajanescu, 2018; Davida, 2021; Hutter & Hutter, 2021; Madhavan et al., 2020):

- Different groups of society should work together to regulate AI technologies. Technology developers, academia, governments, NGOs, and international organizations should agree on better monitoring practices and promote codes of good digital practice.
- Global international agreements should guide government policies to maximize the benefits and reduce risk in the use of AI technologies.
- Governments should be more involved in the protection of people's digital rights, so users are not abused or misinformed. Especially because consumers may not be able to make an informed decision due to a lack of knowledge or the influence of a strong and persuasive AI system (Davida, 2021; Mathur et al., 2019).
- The private and the public sector should create awareness campaigns informing about the power of AIs. AIs can influence people's behavior, and people may not be aware of it (Mathur et al., 2019). Therefore, their freedom and decision-making capacity are hindered.

Policy decisions influence what societies are able to achieve. Therefore, policymakers and society, in general, should be aware of the risks of technology and increase attention to legislation in this complex area. It is real that technology is evolving constantly, and there are unforeseen possibilities, but societies still have to try to reduce the risks. Madhavan et al. (2020) proposed the promotion of proactive policies. A reactive policy is created to solve/regulate a current problem. Proactive policies predict and mitigate potential risks and harms before they exist (Madhavan, et al., 2020). Easier said than done, but we have to try.

Strengths, Limitations, and Future Research

In this paper, I presented a case where a potentially impactful learning tool delivered incorrect information. Findings raise awareness about the importance of accuracy while using AIs in education. It is known that AIs are promising and helpful in many areas and are not accurate yet. Therefore, it is imperative to discuss the topic so that together (scientists, developers, policymakers, users, etc.), we can find options and/or solutions.

The present research has limitations. In this paper, I presented a case study of one user's experiences. Results may not be generalizable. Furthermore, the methodology employed in this study can be considered subjective. Nonetheless, my findings underscore the necessity of further research on this topic. It is critical for fellow scholars and educators to be aware of the pros and cons of technology that can influence users' learning and experience, so additional studies are needed to explore accuracy. It is important to decipher the shortcomings of any tool that has the capability to impact education profoundly.

Future research can explore similar experiences with a larger sample to explore the accuracy of responses and analyze how educational stakeholders are responding to ChatGPT. Moreover, more research is needed to determine how to increase the level of critical consumption among people (students, academics, editors, etc.) while using AI tools.

Conclusion

Many questions emerge from this experience. Can people continue trusting their medical assistant apps? Are the answers accurate? Do chatbots like Siri or Alexa provide truthful information or not? How can people know? Already, the healthcare field is suffering from resources that misinform and mislead consumers (Pomputious, 2019). Even though there are efforts to use AIs to check the accuracy of online sources, the results are not positive yet. Medical misinformation is highly spread by AIs (Pomputious, 2019).

AI is a powerful tool that can be used for good or for bad. Therefore, we should be aware of the risks of self-learning chatbots and look for solutions. The first step in managing the risk is to recognize that AI's are fed with imperfect information, which can produce imperfect outcomes (Bajenescu, 2018; O'Leary, 2022). Another step is to be critical users of the information that is provided, and a third strategy is to talk about these issues, so together, private and public sectors can prevent possible risks.

Another great challenge is to incorporate consciousness into AIs, the consciousness that understands and responds to ethical issues. But if developers achieve *consciousness*, then the problem will be what else these super-intelligent self-learning technologies can do (bad and good!). Even though we do not have the answers, scholars from different disciplines should consider the question.

I hope that my journey helps others to be more critical of the technology that we are consuming. I also hope that OpenAI LP and the companies and charities that are supporting them question the impact that the chatbot can have on the world. In the end, technology should be for bettering society globally.

AIs are convenient in many ways and for many fields. Therefore, it is important to implement regulatory principles that promote the responsible and trustworthy development of AI technology. Regulatory principles can assess the possibilities but also prevent negative repercussions such as misinformation and ethical misconduct.

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