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White Paper: Embracing Responsible Use of ChatGPT in Education

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White Paper: Embracing Responsible Use of ChatGPT in Education

Abstract

This white paper presents challenges and opportunities for integration of ChatGPT, an artificial general intelligence (AGI) model developed by Open AI, in education. Drawing parallels to prior technological innovations in education including handheld calculators, the author asserts that the primary solution lies in guiding students to develop skills for responsible use of available resources. While debates surrounding the use of ChatGPT and plagiarism, misinformation, and ethics are valid, this paper stresses the importance for open conversations and growth mindset. The proposed solution includes a responsible use policy for ChatGPT in the classroom, which emphasizes critical thinking, collaboration, continuous feedback, ethical conduct, and purposeful engagement to enhance the learning environment.

Keywords

ChatGPT, education, calculators, AIGC, responsible use

Author Bio

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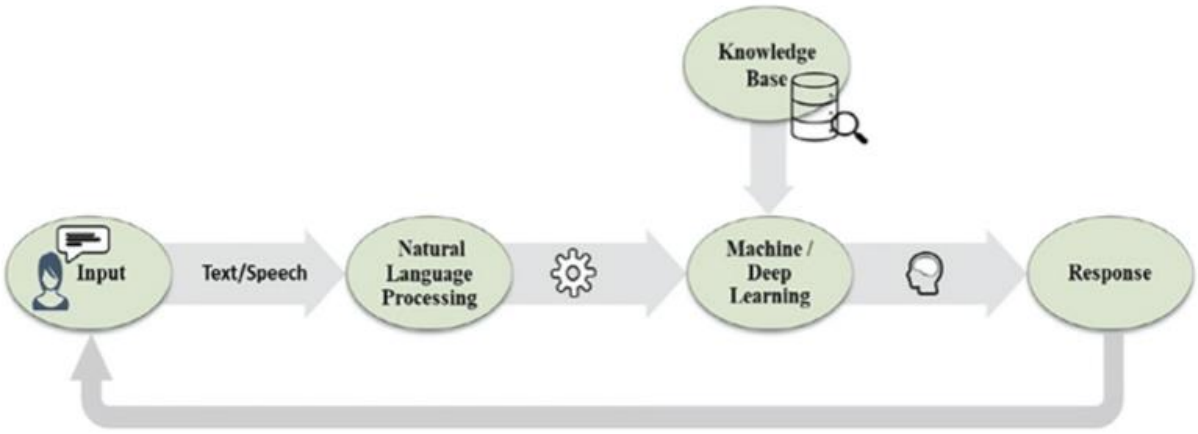
Introduction

On November 30, 2022, OpenAI, an artificial general intelligence (AGI) research and development company, launched ChatGPT (OpenAI, 2022). ChatGPT is a free natural language processing (NLP) model, or chatbot, which allows users to enter text and image prompts to receive generated text responses (see Figure 1). In the first week, over one million users explored the features of ChatGPT. Currently, there are over 100 million active users with approximately 1.6 billion monthly visits (Duarte, 2023).

Figure 1

How a Chatbot Functions



Note: From "Using AI chatbots in education: Recent advances challenges and use case" by M. Aleedy et al., 2022, *Artificial Intelligence and Sustainable Computing: Proceedings of ICSISCET 2021* p. 661 (https://doi.org/10.1007/978-981-19-1653-3_50).

With the philosophy that AGI should benefit all of humanity by amplifying ingenuity and creativity, OpenAI has expressed that "democratized access will also lead

to more and better research, decentralized power, more benefits, and a broader set of people contributing new ideas" (Altman, 2023). Simultaneously, OpenAI has acknowledged the need for caution regarding the capacity and use of AGI as well as responsibility for development and deployment by aligning with human values and using human feedback (Leike et al., 2022). The acronym GPT stands for Generative Pre-Trained Transformer, which implies that ChatGPT is more than a mere chatbot because of the use of Reinforcement Learning from Human Feedback (RLHF). Specifically, ChatGPT-4, which was released on March 14, 2023, has incorporated additional safety and security improvements and mitigations to protect users from false information and dangerous content based on fine tuning and practice conversations (OpenAI, 2023b).

The introduction of ChatGPT has had educators across the country and around the world pondering the implications of AGI or AI (artificial intelligence) on teaching and learning. There has yet to be a consensus regarding the balance between opportunities and threats for use and misuse of AI generated content (AIGC). Whether institutions and organizations currently permit, forbid, or ignore the use of generative AI in school settings, the bottom line is that it has arrived and is here to stay (Kasneci et al., 2023).

The author of this white paper asserts that educational leaders and teachers must assume a responsibility to understand and promote responsible use of AIGC, which includes ChatGPT, both for students and within their own professional environments. For successful integration, however, "teachers need two things: they need time and they

need money" (Creely et al., 2023, p. 37) in order to learn the creative and critical implications of AIGC and education.

Problem Statement

Technological advancements continue to challenge and enhance student learning experiences. The most current advancement spurring significant debate is OpenAI's ChatGPT. Some school institutions and even entire countries have completely forbidden the use of ChatGPT citing problems such as plagiarism and ethics, threats to unique thought, and the potential for disseminating false information (Nolan, 2023; Singh, 2023; Sullivan et al., 2023). While critics propose that ChatGPT invites immense academic integrity problems, others suggest that ChatGPT could be a great partner in educational work.

The fear that artificial intelligence and specifically ChatGPT could disrupt education is not a moot point. In January 2023, intelligent.com asked a sample of 1,000 U.S. college students about their use and knowledge about ChatGPT. The results showed that 30% of the sampled students had used ChatGPT to complete assignments with nearly 60% of this group admitting that they used it more than half of the time to complete written homework. Most notably, the survey revealed that "three-quarters of students who have used ChatGPT for homework say it is 'somewhat' (46%) or 'definitely' (29%) cheating" (Intelligent, 2023, para. 15). The same survey posed the question: "are one or more professors aware that you have used ChatGPT to complete a written assignment?" with 28% of respondents believing that their professors are probably or definitely not aware that students are employing the tool. The problem,

therefore, is not only that students relate the use of ChatGPT to cheating, but also that they believe their professors are unbeknownst to its capacities.

Technological Changes Impacting Education

Technological change impacting educational experiences is not a new phenomenon. Word processing tools, handheld calculators, search engines, and social media are examples of technological innovations that have changed the course of education over the past 50 years. Each innovation has opened opportunities and advantages while also spurring debate. To examine parallel arguments and solutions, this paper will discuss the use of handheld calculators in education settings.

Handheld Calculators

In the mid-1970s, the first affordable handheld calculators became available. Although they had been widely used in other industries, the introduction of calculators to education settings "threatened the whole math teachers' community regarding their students' basic math abilities. At the same time, it was not possible to halt the production of calculators for various reasons, including their benefits" (Duha, 2023, p. 402). Upon integrating calculators into the classroom, some worried that "the basics of education [were] being undermined by machines" but others noted "because of their speed and accuracy, calculators [lent] themselves to complicated problems previously avoided by grade-school teachers" (Pendleton, 1975, para. 7). The solution: Adjust educational priorities, assist students in understanding the functionality and limitations of calculators, and emphasize problem solving over rote computational drills (Banks, 2011).

Between 1975 and 1980, the National Advisory Committee on Mathematical Education (NACOME) recommended calculator access to all students by eighth grade and the National Council of Teachers of Mathematics (NCTM) advised the full use of calculators for all grade levels. Even though student calculator use became common in the 1970s, it was not until 1994 that College Board mandated the use of calculators on the Advanced Placement (AP) Calculus Exam and began allowing calculators in the Scholastic Aptitude Test (SAT). In part, these delayed changes were due to concerns regarding equitable access for all students. By 1997, 95% of students were using a calculator for the math portion of the SAT (Watters, 2015).

According to the NCTM, calculator use "enhances the understanding of mathematics concepts and student orientation toward mathematics" (NCTM, 2011). Counterarguments often include that previous generations learned without the assistance of a calculator or that the use of a calculator will become a crutch and interfere with number sense or procedural fluency. Lynch-Davis (2015), therefore, emphasized that teachers must support students in strategic navigation and use of their calculators as well as "provide opportunities to think about when it makes sense to use a calculator" (para. 2).

The pros and cons discussed regarding calculator use are uncannily similar to current debates about AI generated content (AIGC) and specifically ChatGPT use and application in the classroom. Notably, calculator use continues to be a topic of debate. For this reason, it is unlikely that consensus will be met regarding ChatGPT either. Similar to the fear that calculators would prevent the development of number sense or

that google searches would eliminate the need for students to remember facts (Bruder, 2023), concern that AIGC and specifically ChatGPT, will be detrimental to creative thought is likely myth.

Grammarly and Wolfram Alpha

Universal access to artificial intelligence (AI) is not new; it has been around for years. For example, when text messaging, email, word processing software, and search bars present an anticipated upcoming letter, word, or phrase, AI is involved making those suggestions by predicting upcoming text. According to Creely et al. (2023), ChatGPT is simply a large-scale predictive text.

Specific to education settings, many students have already been using programs that have imbedded predictive text components for several years. For writing support, many students use Grammarly. For mathematics help, many students use WolframAlpha. Both of these resource websites offer suggestions and algorithms that depend on AI.

Grammarly can analyze text to offer suggestions on grammar, spelling, punctuation, style, and tone to improve written communication (Grammarly, 2023b). On their site, Grammarly refers to its capacity as being a collaboration partner by "helping you brainstorm initial ideas, format citations accurately, and everything in between, so you submit your best work with integrity" (Grammarly, 2023a). If used for the intended purposes, Grammarly can be a great resource for guiding students to improve their writing skills to submit polished pieces. Dependent on the purpose of an assignment, however, its employment could be construed as academic dishonesty.

WolframAlpha can simplify mathematical expressions and solve equations showing step-by-step computational solution processes (WolframAlpha, 2023a). On their site, WolframAlpha advertises itself to students as "the ultimate tool for homework and research" (WolframAlpha, 2023b). If a student simply inputs all of their expressions or equations to have WolframAlpha complete the computations, then this would be cheating on a math assignment. If, however, a student completes the assignment and checks results by using WolframAlpha's capabilities, then the resource is being used for its intended purpose.

Both Grammarly and WolframAlpha have been making improvements for over 10 years for their millions of users (Harris, 2023; WolframAlpha, 2023a). Also, it is clear that both resources can support student learning if used properly but they have the potential for academic dishonesty if used excessively. Lastly, both of these resources now partner with ChatGPT (Grammarly, 2023b.; WolframAlpha, 2023a).

Proposed Solution

The transformative effects of new advancements on education must be examined in relation to the purposes and outcome goals of school-based learning. Unfortunately, there is not a widely accepted consensus on the matter of "what is education for?" (Robinson & Robinson, 2022). In the book *Imagine If…*, Sir Ken Robinson (2022) described his belief "that education should expand our consciousness, capabilities, sensitivities, and cultural understanding" by providing learners with opportunities to "engage in the economic, cultural, social, and personal challenges they will inevitably face in their lives" (p. 39). He further defined eight competencies – curiosity, creativity,

criticism, communication, collaboration, compassion, composure, and citizenship – which if integrated into the educational journey will nurture holistic learning and enrich the development of traditional subject disciplines. While ChatGPT cannot replace or conceal the cultivating of these aptitudes, its implementation as a tool has the potential to foster and support student development of them.

Effective integration of AI generated content in learning settings will require educators to implement well-defined strategies and robust pedagogical approaches. These approaches should prioritize critical thinking and modelling of strategies for fact-checking (Kasneci et al., 2023). Without appropriately scaffolded integration, ChatGPT carries the risk of students presenting factual inaccuracies, which can lead to discrediting, as well as engaging in unethical practices such as plagiarism, which constitutes theft and reflects poor scholarship. This holds true for all reading, writing, and research though. When students learn about research methods, they must cultivate the skill of posing important questions about the authorship and purpose of each information resource. Creely et al. (2023) emphasized asking similar questions when engaging with the AI generated content of ChatGPT:

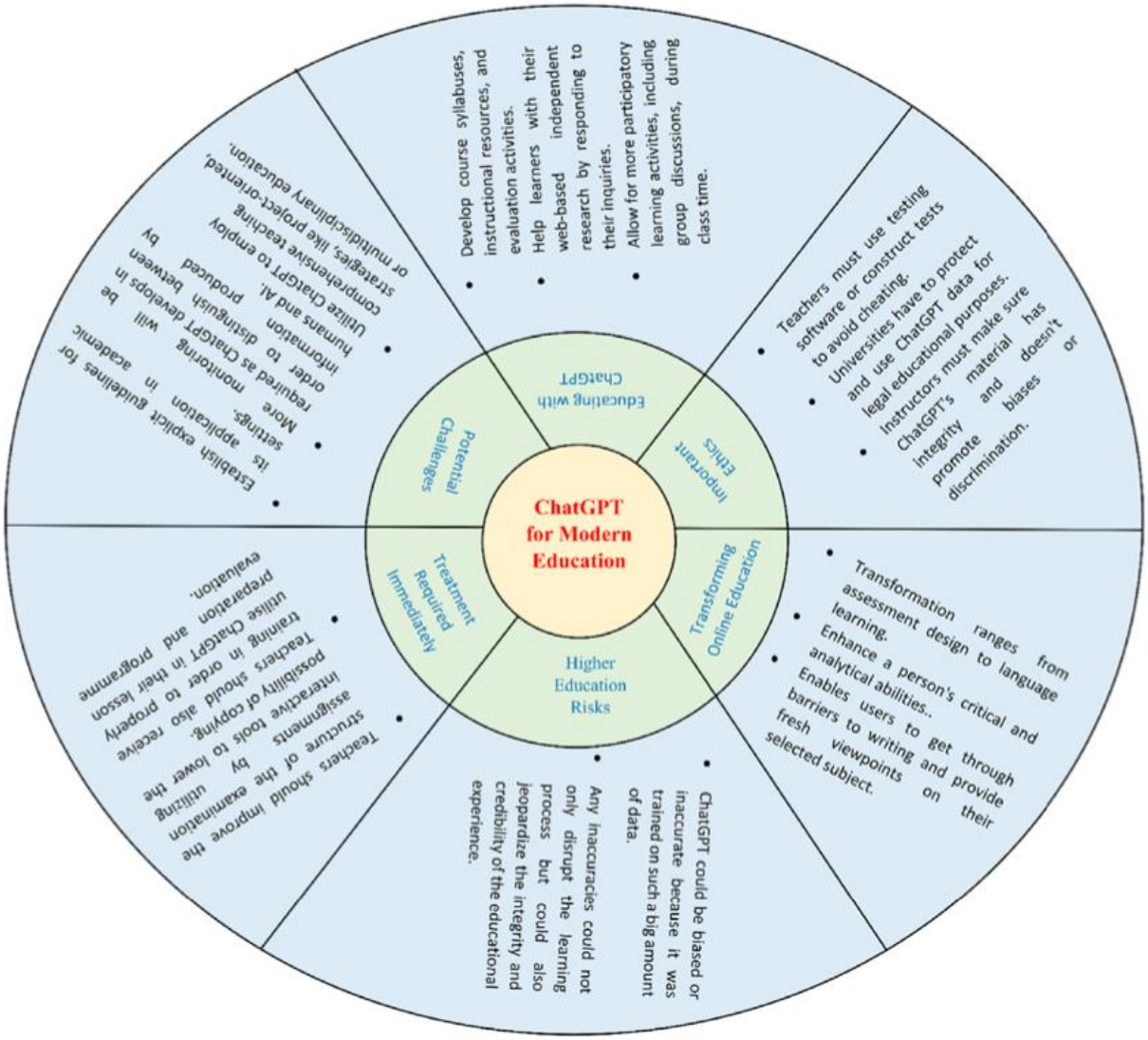
> Who created this tool? And for what purpose? What are the affordances? And limitations? What are the risks? And where's the bias in this information? And what are the impacts of these tools on our relationships with knowledge, writing, and how we understand literacy? (p. 39)

Asking and answering these questions demonstrates several of Robinson's educational competencies, namely criticism, curiosity, and citizenship.

Beyond the imperative of guiding students in navigating ChatGPT, educators must actively reflect on and adapt their own current practices and approaches to learning. As noted in findings from the intelligent.com survey, a significant challenge regarding the integration of ChatGPT into education is that students perceiving its use as cheating and as well as believing their instructors were unaware of its use (Intelligent, 2023). Effective educators are in constant cycles of reflection and adaptation of their methodologies. Now, they must extend the reflective process to include a consideration of how ChatGPT's availability can enhance their pedagogy. Gill et al. (2023) suggested strategies for educating with ChatGPT, including examining risks, evaluating ethical considerations, and enhancing evaluation techniques (see Figure 2). Proactive engagement with ChatGPT will require open conversations between students and instructors as they evaluate the transformative effects on education together.

Figure 2

Transformative Effects of ChatGPT on Modern Education



Note: From "Transformative effects of ChatGPT on modern education: Emerging era of AI chatbots" by S. S. Gill et al., 2023, *Internet of Things and Cyber-Physical Systems, 4*, p. 22 (https://doi.org/10.1016/j.iotcps.2023.06.002).

Conclusion

In alignment with the democratized access philosophy of OpenAI, educational institutions have an obligation to provide equitable opportunity for access to digital tools including AI generated content (AIGC) such as ChatGPT. Prohibiting or even limiting the use of ChatGPT is not the solution (Gill et al., 2023; Yang, 2023). If a math instructor fails to integrate calculator fluency into their classroom pedagogy, their students risk unequal preparedness and reduced opportunities. As similarly emphasized by university professor Yang (2023), "my students will soon be graduating and starting jobs, and their employers might ask them to work with artificial-intelligence models. If they don't know how to use them properly, it could hold them back" (para. 3). Therefore, the best course of action will be to recognize the impossibility and illogicality of banning ChatGPT and other AI powered tools, learn about the educational capacities, and teach learners how to responsibly use available resources.

It must be noted that ChatGPT did not have the capacity to write this paper. First, ChatGPT does not have real-time access to current databases or the internet and its last knowledge update was in January of 2022. Also, ChatGPT does not have the faculty to follow organized writing structures, including properly integrating and referencing scholarly resources. Lastly, it has limited understanding of complex or nuanced subject matter in context. The author of this white paper did, however, prompt ChatGPT to draft a responsible use policy for an instructor to provide for students regarding integration of ChatGPT as a resource in a class. The policy is provided in the Appendix.

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Appendix: Responsible Use Policy for ChatGPT in the Classroom

Dear Students,

As we integrate ChatGPT into our learning environment, it is essential to establish guidelines to ensure responsible and effective use. ChatGPT is a powerful tool that can enhance our educational experience, but its responsible utilization is crucial. Please adhere to the following guidelines:

1. **Purposeful and Educational Use:** Use ChatGPT for educational purposes, such as enhancing understanding, brainstorming ideas, or exploring creative writing exercises.
2. **Ethical Conduct:** Avoid using ChatGPT for any unethical activities, including plagiarism, cheating, or generating inappropriate content.
3. **Critical Thinking:** While ChatGPT can provide information, it is important to critically evaluate its responses and cross-verify information through reliable sources.
4. **Collaboration:** Encourage collaborative use by discussing ChatGPT-generated content with peers, promoting a shared learning experience.
5. **Respect for Diversity:** Be mindful of potential biases in language models and address any concerns or biases identified in ChatGPT outputs.
6. **Privacy and Confidentiality:** Do not input or request sensitive or private information. Respect the privacy of yourself and others.
7. **Balanced Integration:** Use ChatGPT as a supplementary tool, recognizing that it complements, but does not replace, traditional learning methods and human interaction.
8. **Limit Screen Time:** Be conscious of your screen time and balance the use of ChatGPT with other learning activities.
9. **Report Inappropriate Use:** If you come across any misuse of ChatGPT, report it to the teacher promptly.
10. **Continuous Feedback:** Provide feedback on your experiences with ChatGPT. This helps improve our understanding of its strengths and limitations.

By adhering to these guidelines, we aim to create a positive and responsible learning environment where ChatGPT can be a valuable asset in our educational journey.

Thank you for your cooperation.

[Teacher's Name]
[School Name]
[Date]

Note: From OpenAI. (2023a). *ChatGPT 3.5*. (March 14 version) [Large language model]. https://chat.openai.com/chat