

Using ChatGPT in the Classroom: Opportunities, Limitations, and Ethical Considerations

Ranjith Kingston Gladstone,

Assistant Professor, Department of Education, Spicer Adventist University, India

Abstract

November 2022 was a turning point in open artificial intelligence (AI). The community of educators jostled at the function, as it gained a million users within a month. This was the introduction of ChatGPT, a sophisticated chatbot developed by OpenAI. This paper explores the history of ChatGPT, its capabilities, and the potential benefits and limitations of its use as a tool in the classroom. It also addresses the ethical concerns and privacy implications of using models, such as ChatGPT. The aim was to provide educators with insights into how they can effectively incorporate ChatGPT into their teaching practices while being mindful of ethical considerations.

Keywords: ChatGPT, chatbot, education, opportunities, limitations, ethics, privacy

Introduction

The talk among educators at the start of November 2022 is all about ChatGPT. Some wonder what it is all about, while others do not even know what it means in education. However, it took the world like a whirlwind as millions of users grew (Kalla & Smith, 2023; Lund, Wang, & Friends Lab, 2023; Wilichowski & Cobo, 2023). “It has reached 1.8 billion visits by April 2023” (Dilmegani, 2023, para 1). The emergence of open ChatGPT and its widespread adoption has led to nerve breakdown in both direct and indirect users. Countries like Italy and a few other countries such as Russia, China, Iran, and North Korea later joined in banning the use of ChatGPT in their countries (McCallum, 2023). In Italy, this reaction was over regulatory actions and data protection generation concerns in the education sector. However, ChatGPT is an open chatbot, similar to earlier chatbots. Natural language processing (NLP) techniques have been used to create chatbots, enabling them to comprehend and interpret human language inputs (Khanna et al., 2015).

* *Email address:* rkgladstone@sau.edu.in

Recently, Younger generations, who prefer instant, one-on-one connections through short messages, have increased their use of chatbots (Lokman & Ameen 2018). This study aims to provide ample knowledge about the history of Open ChatGPT, opportunities, limitations, and ethical considerations in using Open ChatGPT or similar open AI tools in education.

History of Open ChatGPT

OpenAI was established in 2015 (Brockman et al., 2016). Several machine learning tools have been created to pursue AI for public use, such as DALL-E and ChatGPT (Devlin et al., 2018). Early in 2022, DALL-E, a machine-learning system that creates innovative graphics based on user inputs, attracted significant public interest (Marcus et al., 2022). Its ability to comprehend user requests using NLP ideas similar to those used in ChatGPT, and to build images using artificial neural networks with multimodal neurons allows it to produce a wide range of novel images (Cherian et al., 2022; Goh et al., 2021). The Generative Pre-Trained Transformer (GPT), a language model developed by OpenAI, can generate a response text that is nearly equivalent to spoken English (Dale, 2021). A two-step process that combines generative unsupervised pretraining with unlabeled data with discriminative supervised fine-tuning to increase performance on specific tasks improves the principles of GPT (Erhan et al., 2010; Budzianowski & Vuli, 2019).

The ChatGPT operation can be divided into several steps. The user first enters a question or prompts a program. The model analyzes this prompt and produces a response based on its understanding of the linguistic links and patterns. The user is then given the opportunity to respond to the response again or to pose another query. This approach uses only reinforcement learning with feedback from people (Figures 1 and 2). They are: a) SFT Model—This Supervised Fine-Tuning model is trained using demonstration data that has been gathered; b) RM Model—the Reward Model will provide points based on how appealing the output of the SFT Model is to consumers; and c) the SFT model using PPO— by allowing reinforcement learning to maximize the RM, the SFT Policy is adjusted. Here, PPO refers to the fine-tuned model of proximal policy optimization (Kalla & Smith, 2023).

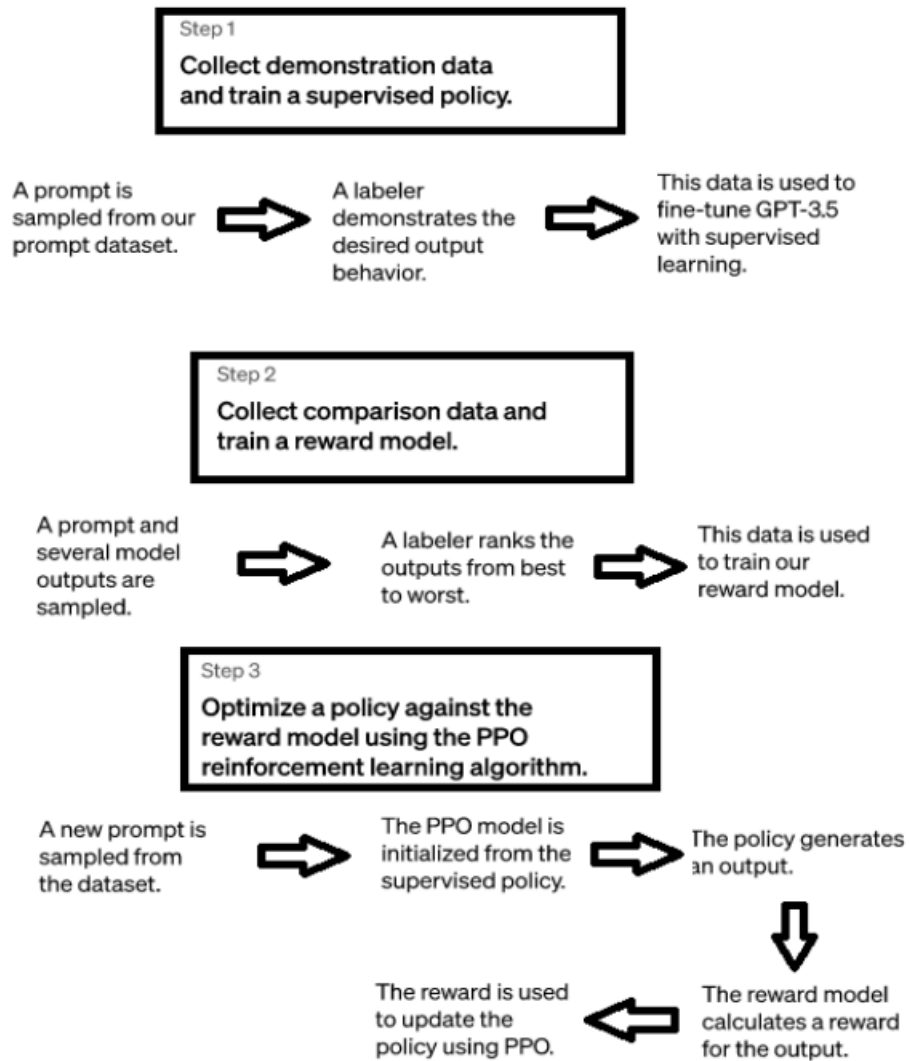


Figure 1. *RLHF Training Method of ChatGPT*

Note: From *Study and Analysis of Chat GPT and its Impact on Different Fields of Study* (p. 827) by Kalla, D., & Smith, N., 2023. Retrieved from http://www.ijisrt.com/article_info.php?article_id=IJISRT23MAR956

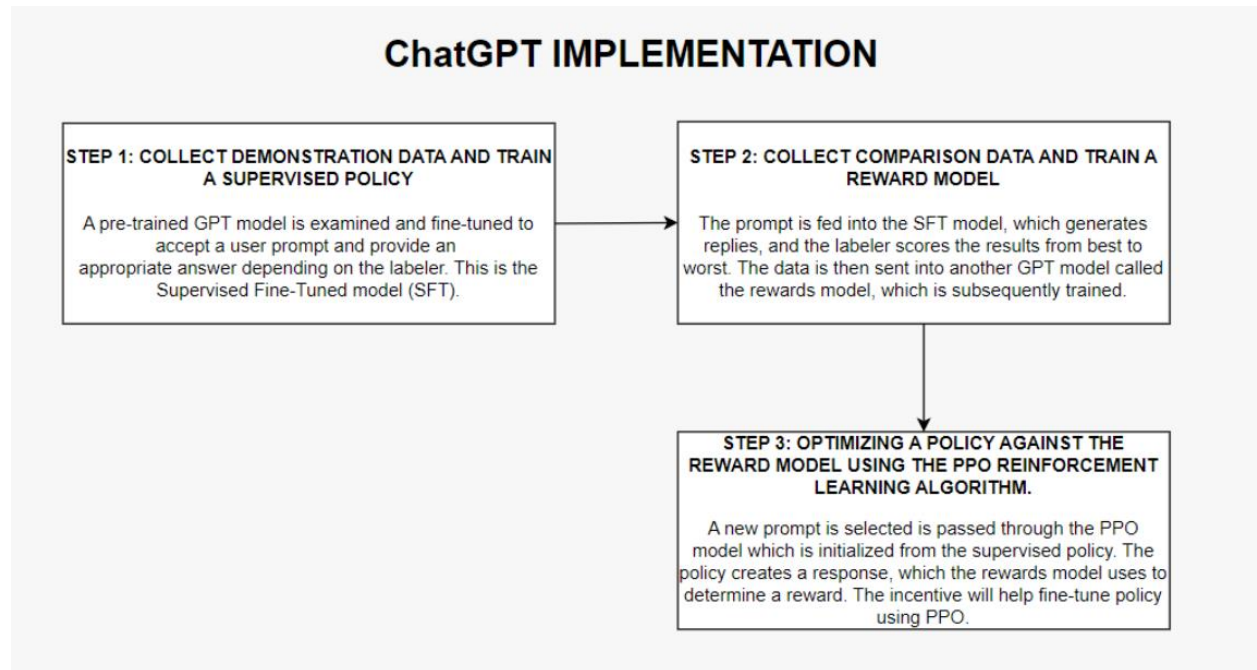


Figure 2. *GPT Implementation Process*

Note: From *ChatGPT and a New Academic Reality: AI Written Research Papers and the Ethics of the Large Language Models in Scholarly Publishing* (p. 6) by Lund et al. 2023. DOI: 10.1002/asi.24750

The application of ChatGPT in various industries has no limits. Dilmegani (2023) and Victor (2023) posit that there are 40 uses currently and a few others. They are listed as General ChatGPT Use Cases in a) Textual Applications—Content creation, Translation, Conversational AI; b) Coding Applications—Writing code, Debugging, Code completion, Code refactoring, Code documentation, Code snippets generation, and Explaining coding techniques and concepts; c) Educational Applications—Course content creation, Grammar and writing check, Grading, Designing syllabus outline, Help with homework, Research assistance, and Language learning; d) Marketing & SEO Applications—Content creation for content marketing campaigns, Personalization of customer experience, Audience research, Writing product descriptions, chatbot for customer support, Creating customer surveys, Generate topic ideas for content writing, Conduct keyword research, Find the right titles, Group search intent, Create content structure, Generate meta descriptions, and Create sitemap codes; e) Customer Service Applications—Multilingual customer support, Personalized responses to customer queries, Quick responses to customer inquiries & complaints, Creating emails for customers, Sentiment analysis, Replying to customer reviews, and Answering FAQs; f) HR Applications—Creating job interview questions, Generating onboarding materials, and Job description generation; g) Banking—Personalizing financial advice, fraud detection, and Legal Contracts; h) Healthcare—Medical Transcription, Patient Triage, patient-facing assistants, and summarization of patient records; and i) Media & Entertainment—journalism and news

media, writing scripts, and OTT platforms. Although they have many applications, they also have limitations.

The limitations of ChatGPT technology include lack of common sense, lack of emotional intelligence, limitations in understanding context, trouble generating long-form, structured content, limitations in handling multiple tasks simultaneously, potentially biased responses, limited knowledge, accuracy problems or grammatical issues, need for fine-tuning, and computational costs and power (Marr, 2023).

Using ChatGPT as a Tool in Education

In education, Wilichowski and Cobo (2023) and Lund et al. (2023) posit that the ChatGPT could be used as a tool for teachers as follows: a) enhancing lessons and lesson preparation—can convert lesson and learning objectives into engaging lesson plans; b) create assessment questions—improving assessment questions and critical thinking skills, it can generate multiple-choice items, essay questions, and practical tasks, critical thinking, problem-solving, and collaborative skills; c) support with language barriers—supporting language proficiency of teachers by helping them to teach more effectively in their native language or a foreign language; d) providing additional student support—ChatGPT is a tool that teachers can use to encourage student curiosity and provide ideas for homework assignments. AI tools are especially helpful when they can identify the data sources utilized in discussions; e) Grading assessments and papers—for teachers to examine and more effectively differentiate student learning levels, it might produce a substantial dataset. Potential unintended effects include low accuracy, subpar grading, or proctoring, which incorrectly flags students as cheaters. It is crucial to take precautions to ensure fairness, accountability, secrecy, and transparency of their algorithms whenever necessary while thinking about proctoring or grading systems; f) Tutoring students—ChatGPT is a tool that teachers can utilize to offer online tutoring to their pupils. Teachers responsible for many students and lacking time to personalize their lessons to each student's needs individually could provide students with an adaptable learning assistant “for free” that adapts to their learning needs. The GPT might direct students as they advance through their courses, according to Khan Academy; and g) research writing—by improving metadata, indexing, and summaries of research findings, ChatGPT can aid in the diffusion of new research ideas (Lund & Wang, 2023). This might encourage the dissemination of research if the public believes it is trustworthy and useful. Findings from converting scientific information into understandable terms for a general audience (Wang et al. 2022). ChatGPT can also be used as a recommender system to help users find pertinent research studies, depending on their search criteria.

What Not to Do for Teachers

On the other hand, teachers are challenged by the introduction of Open AI such as ChatGPT. Though there are many uses for ChatGPT, teachers must be cautious about using ChatGPT at all levels. If students and teachers use it for cheating, how can they find it? Teachers must be aware of ChatGPT and its limitations. Do not completely or blindly rely on the output or data generated by OpenAI. Second, teachers should be able to

supervise students. Teachers must actively participate in the teaching and learning process when utilizing ChatGPT, especially when it involves youngsters, to guarantee that students utilize the technology appropriately and safely (Wilichowski & Cobo, 2023). Furthermore, the teacher should be able to answer the following questions before using ChatGPT: (a) How should tools such as ChatGPT be introduced into curriculum design, and in what ways? (b) How do conversational technologies improve teaching and learning effectiveness? (c) Can ChatGPT improve students' educational experience? If so, what do the students think about and experience? (d) What benefits do students with disabilities expect from ChatGPT and other AI driven conversational technologies? (e) How can ChatGPT efficiency be evaluated in terms of student achievement and use intention? (f) What are the potential advantages and drawbacks of using ChatGPT for teaching and learning in the long term? (g) What are the disadvantages of ChatGPT in the educational context? (h) How might the ChatGPT help students and researchers improve their thinking abilities and problem-solving skills? (i) How can the academic community deepen their understanding of ChatGPT and other AI-powered conversational technologies? (j) How would ChatGPT affect academic writing and research in the long term? (k) How does the use of the ChatGPT in scientific writing affect human creativity? (l) How can the academic community effectively address disruptive emerging technologies that could endanger the ways in which teaching, learning, and research are conducted? (Dwivedi et al., 2023)

Acknowledging the importance of teachers' roles in using ChatGPT, teachers should be aware of the parameters within which they can use it as a tool. Although OpenAI helps prepare lesson plans, its execution in the classroom depends on the presence of the teacher's mind. It is not impossible to cheat with the ChatGPT. ChatGPT generates flawlessly written essays free of spelling and grammatical mistakes in a matter of seconds, but its information is sometimes accurate. Answers from the ChatGPT are taken from websites that may be prejudiced, out-of-date, or unreliable. Furthermore, ChatGPT could be used as a tool rather than the control of the complete teaching profession. Teachers must be vigilant when using ChatGPT as a tool for teaching and other dissemination.

Ethical Considerations

Great power comes with a great responsibility. This is a common phrase in superpower icons (Seland 2018). The development of the ChatGPT and other AI-driven technologies has resulted in a big bang. Hence, the ChatGPT and other Open AIs should take ethical responsibility. According to Bender et al. (2021), voluminous source-backed materials are not necessarily absolute truth. These perspectives could be based on the training or usage of ChatGPT neural language.

There is a greater chance of bias in ChatGPT responses due to the training of specific NLP perspectives. Additionally, the dissemination of covert and unintentional prejudice results from the use of these models to generate academic research. The new period would be completely different from the academic world, in which each piece of data was verified. Now that AI-generated data may introduce potential biases and inaccuracies that are challenging to spot and fix, the integrity of science may be at risk (Muller, 2021). As a

result, research findings may become even more unequal and the tenets of science may be threatened.

Any ethical analysis of the ChatGPT must consider its potential for distortion. Research articles written using the ChatGPT may be considered unoriginal and problematic from an ethical perspective. The likelihood of bias in the model outputs, which can reflect the biases present in the training data, is a cause for concern. Concerns have also been raised regarding the privacy of people whose data were utilized to build the algorithm. The ethical ramifications of producing realistic synthetic text or speech are crucial because they can be used to fool or misrepresent people.

Responsible Use of ChatGPT

In the technology-driven world, the important role of teachers is to help students become responsible for using the OpenAI ChatGPT. Some significant factors for students and teachers are explained as follows. For students, they are: a) Guide—The ChatGPT should serve as a guide for the students to gain more insights on the subject they want to learn; b) additional source—the use of the OpenAI would be an activity to obtain additional resources, rather than completely relying on it; c) ethics —students should be taught how to have fair use and give proper credit for the sources; d) integrity—should use ChatGPT to learn more and to assist in their learning rather than to cheat in completing their homework; and e) advancement—additional knowledge about the query should be a concern for students to use the chatbot.

For teachers, they are a) training—the Teachers should use NLP to train their bots to assist in teaching. Further, teachers will require pedagogical expertise to deliver the lesson in a high-quality manner; b) ethical intervention— questions that ChatGPT cannot answer should be the focus of teachers’ attention. In particular, queries requiring expertise are not included in the chatbot’s training data, such as those involving human emotions or subjective viewpoints; c) Emotional—The teachers must understand that ChatGPT cannot understand emotions. Therefore, teachers cannot take it for granted that additional channels like OpenAI; instead, they should empathize with the students; and d) accountability—promoting transparency and accountability. For example, the “AI-driven infodemic” is a result of the utilization of LLM’s capacity to produce enormous quantities of human-like writings quickly and generally without any scientific foundation or support (De Angelis et al., 2023); and e) support — teachers should help themselves as well as the students in relation to the protection of privacy and sensitive information.

Conclusion

Introduction of Smart Chatbot Created by OpenAI. This is only the beginning and not the conclusion of earlier difficulties. Teachers should use ChatGPT. The following are some of chatbot’s main benefits: a) creating lesson plans (unit outlines, lesson plans, slide shows, x-factor instruction, simplifying topics, and discussion questions); b) creating handouts and other materials (developing instructions that outline cooperative learning roles and expectations, creating assignment directions with a thorough overview, grading criteria, a description of the required format, and task details, creating solved examples

of math problems, chemistry equations, etc., etc.); c) assessing student performance; and d) assessing student progress (with explanations of each step, create a prereading or advance organizer by extracting important and challenging words from a chapter and listing them with definitions, offer word problems, such as those involving ratios, create a syllabus, create flashcards with questions and answers, and create posters that list classroom rules); e) writing instruction and feedback (prompt generator, essay improvement, grammar feedback); f) differentiation; g) professional correspondence; h) assessment (quizzes, rubrics, checklists, cloze test); and i) professional communication. Although these advantages persist, there are limitations to using OpenAI ChatGPT. As Teachers, awareness is very important regarding the use of chatbots. This study recommends further empirical studies on the OpenAI ChatGPT. Let everyone come together and reason (Isaiah 1:8).

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About the Author:



RANJITH KINGSTON GLADSTONE was born in Tamil Nadu, India, to Adventist parents, Mr. D Gladstone and Mrs. Patricia Gladstone. He is married to Mrs. Carol Linda Kingston, and they have a son, Carl Jason Harston Kingston. He has vast experience in teaching across many fields and places, such as Spicer Adventist University (India), Adventist University of Africa (Kenya), Andrews University (USA), Dewey International University (Cambodia), and AIIAS (Philippines). He has authored and co-authored books, blogs, peer-reviewed journals, magazines, and so on. Also, presented and awarded at International and National Research Conferences across the globe.