ChatGPT and Critical Pedagogy in American Education Systems: should there be a reason to get worried?

Abstract

It is astounding to imagine that the concept of ChatGPT is less than half a decade old. Yet, it is steadily becoming a household name in almost all organizations, corporations, and schools. No doubt ChatGPT is transforming educational systems with its abilities to streamline educators' workloads, accelerate the engagement of students, and reimagine the teaching-learning process that could potentially result in improved academic outcomes as its adoption becomes widespread. This study sought to test a null hypothesis of no significant relationship between the use of ChatGPT and the deployment of critical pedagogy by educators. With a sample size of 74 educators selected both purposively and through convenience strategy, the study used the Pearson linear correlation coefficient to analyze data. With the level of significance set at 0.05, the study found r=0.031, and sig.= 0.114, hence the rejection of the null hypothesis and the acceptance of its alternate, leading to the conclusion that ChatGPT impacts critical pedagogy positively. Even as debates rage on its adoption and usage in educational settings, most schools and even regulatory agencies are yet to fully appreciate the extent to which ChatGPT impacts critical pedagogy. This paper recommends that educational institutions should put policies and procedures in place to ensure the ethical usage of ChatGPT in educational settings.

KeyWords: *ChatGPT*, *Critical Pedagogy,* ethical, *pedagogy, regulatory agencies*

INTRODUCTION

In this rapidly evolving world of education, there has been unprecedented growth in the adoption of artificial intelligence. Today, the digital age has seen learners fully utilizing immersive technologies for learning from kindergarten to terminal degree programs. The use of artificial intelligence (AI) is steadily becoming embedded in most institutions' modus operandi, thereby fundamentally altering the landscape of teaching and learning (Jara and Uso 2021). One transformative development has been the introduction of a language model based on the Generative-Pretrained Transformer (GPT). ChatGPT is a language model that uses artificial intelligence to engage in natural language conversations.

Whereas ChatGPT and similar language models have the potential to transform education, they have come with new challenges and opportunities that need to be acknowledged and addressed (Molilick, 2023). The reception of Chat GPT has been varied across the board. While some educators view it as a helpful tool to enhance learning and reduce educators' workload, other stakeholders view it as a potential threat to academic integrity. Some schools have therefore hailed it and embraced it, even moving forward to adopt policies that guarantee its responsible usage. On the other hand, those uncomfortable with it - for example, some schools in New York- have banned students from using it (Yang,2023).

In every technology there is a powerful idea: All technologies carry a bias or belief about the world that impacts people and their lives Ray (2023). Technologies can convey intellectual, emotional, political, sensory, social, or content biases. In other words, technologies need humans to think or behave in certain ways to fulfill their function and spread. Educators can invite students to imagine technology as a living organism and ask. Mollick (2023) contends that even as this rapid proliferation of AI in general and ChatGPT in particular in nearly every aspect of our educational lives, there is a need to acknowledge the growing presence of generative AI in daily lives by understudying how ChatGPT confluences with the principles of emancipatory pedagogies. As a liberatory educational endeavour, the intersection of ChatGPT and critical pedagogy presents both opportunities and challenges in education Baidoo-Anu & Owusu (2023). While ChatGPT has the potential to complement and enhance critical pedagogy by facilitating access to information, promoting dialogue, and supporting personalized learning, educators must approach its integration thoughtfully, considering both its benefits and limitations within the context of fostering critical consciousness and empowerment among learners(Barror 2023). ChatGPT is providing diverse perspectives and challenging current ways of thinking. This could imply that it is a resourceful tool in promoting critical pedagogy.

To fully appreciate the role ChatGPT plays in contemporary society, its origin and development should be understood. Its origin is largely attributed to Elon Musk and other tech behemoths like Sam Altman and Greg Brockman among others in 2015. The rise of ChatGPT is closely linked to the development of OpenAI's language models and their pursuit of advancing artificial intelligence capabilities. According to Partha (2023), the invention and evolution of ChatGPT to its current model have over time taken three critical phases which include:

(i) The introduction of the transformer architecture, ultimately enabled the creation of highly efficient and scalable language models.

(ii) The subsequent development and release of the GPT series, which demonstrated the potential of AI-Language models in various applications, including text generation, translation, and summarization,

(iii) And finally, the release of ChatGPT, which built upon the success of its predecessors while incorporating improvements in accuracy, context understanding, and versatility.

Further, Partha (2023) contends that the current model of ChatGPT is imbued with significant features that afford it a unique opportunity for continuous improvement. These functionalities include:

(i) Enhanced context understanding: ChatGPT can better comprehend and respond to complex nuanced inputs, making it more effective in generating accurate and relevant texts.

(ii) Reduced biases: Whilst not completely free of biases, ChatGPT benefits from ongoing efforts to minimize biases in training data, leading to more objective and balanced outputs.

(iii) Finetuning capabilities: ChatGPT can be finetuned for specific tasks and applications, allowing it to be tailored to the unique needs of researchers across various scientific disciplines.

Launched in November 2022(OpenAI,2022b), the chatbot ChatGPT is a model of AI that significantly understands language and retains knowledge. The invention of Chat GPT was inspired by a need to bring forth a versatile sophisticated language model with capabilities of performing a myriad of tasks not limited

to data analysis, translation, and text generation (Halem et. al,2023). This advanced natural language processing model was designed to decipher generate and respond to human-like text-based human queries it receives while operating on the deep learning principle and leveraging the large-scale datasets. Studies seem to validate Chat GPT's tremendous capabilities in generating human-like conversational responses to user queries (Baidoo-Anu & Ousu, 2023; Lee,2023). For instance, Koetsier (2003) notes that ChatGPT-4 passed a postgraduate examination in the disciplines of Law and business and achieved the top 10% in these exams. According to Mintz (2023), Chat GPT has even been listed as a co-author in several academic publications. This is a further testament to its recognition as a consequential component that is worthy of deep inquiry and understanding.

AI has revolutionized various facets of daily life, progressing from simple human-like behaviours to sophisticated applications such as machine learning and neural networks. Leveraging large language models (LLMs) and the generative pretraining transformer (GPT), AI has reached remarkable heights. OpenAI's ChatGPT, an LLM, undergoes training through machine learning algorithms on extensive text datasets, equipping it with versatility in interactive applications. It can be finely tuned for specific tasks, including translation, summarization, question answering, and conversational interactions.

Philipson and Weerif (2017) argue that Critical pedagogy is an educational theory and practice that emerged primarily from the work of Brazilian educator Paulo Freire. It is rooted in the belief that education is a political and inherently liberatory act, and it aims to empower learners to critically analyze and challenge oppressive social structures. According to Greene (2017), the key principles of critical pedagogy include Critical *Consciousness*: Critical pedagogy seeks to foster critical consciousness, or conscientização, among learners. This involves developing an awareness of the social, political, and economic forces that shape society and recognizing how these forces perpetuate oppression and inequality. *Dialogue and Collaboration*: Critical pedagogy emphasizes the importance of dialogue and collaboration in the learning process. Teachers and students engage in open, respectful dialogue where everyone's voice is valued, and knowledge is co-constructed through shared inquiry and reflection. *Empowerment and Agency*: Critical pedagogy seeks to empower learners to become agents of social change. Through education, individuals are encouraged to challenge injustice, advocate for social justice, and work towards creating a more equitable and just society. *Contextualized Learning*: Critical pedagogy recognizes the importance of connecting education to learners' lived experiences and the social realities of their communities. Learning is situated within the context of learners' cultural backgrounds, identities, and socio-economic circumstances. *Transformative Action*: Critical pedagogy goes beyond mere understanding to inspire transformative action. Learners are encouraged to apply their critical thinking skills to analyze and address real-world problems, working towards social transformation and liberation. *Democratic Education*: Critical pedagogy advocates for democratic and participatory approaches to education. It challenges traditional authoritarian models of education and promotes practices that empower learners to actively participate in decision-making processes and shape their own learning experiences.

Alexander (2020) opines that overall, critical pedagogy seeks to create educational spaces that foster critical thinking, social consciousness, and collective action, with the ultimate goal of promoting social

justice, equity, and liberation. It has been influential not only in formal educational settings but also in community organizing, activism, and social movements around the world.

Challenges of ChatGPT

It is not unsurprising that the emergence of ChatGPT in education has raised potential risks and concerns. Chief among the concerns include its usage by students in writing their school assignments thereby compromising academic integrity. Complicating the situation is the fact that if used expertly, ChatGPT-produced essays can even bypass plagiarism detection tools (Fijaco et al., 2023). It is feared that this, in due course may defeat the very purpose of education since the critical learning outcomes such as the ability to write will not be met.

In view of its limitations, Liebrenz et.al., (2023) further identify quality assurance issues as well as dependency as potential downsides associated with the use of ChatGPT. There is potential for dependency on these Generative models for any inquiry. Overreliance might lead to the death of critical thinking and problem-solving skills in the general population Partha (2023), yet the key fundamental function of education is the desire to inspire these two 21st-century skills.

Theoretical foundations of critical pedagogy would argue that while ChatGPT presents transformative potential in education, it risks aligning with banking models of learning. Freire's concepts prompt us to consider how ChatGPT can be integrated to serve emancipatory aims (Barrot 2023). For instance, ensuring that ChatGPT facilitates contextualized learning experiences and preserves learner agency are crucial considerations. Moreover, questioning biases in ChatGPT training data aligns with Freire's commitment to consciousness-raising, enabling educators to navigate potential pitfalls and maximize the technology's benefits.

Despite the innovative possibilities ChatGPT offers for personalized and interactive learning, a Freirean analysis reveals certain tensions and drawbacks. ChatGPT's reliance on the huge internet-scraped datasets risks perpetuating inherent societal biases, similar to the banking model of education that is criticized by Paulo Freire. Furthermore, even if ChatGPT excelled at recalling information, it cannot actively engage in the dialogic, emancipatory learning processes as championed by Paulo Freire. According to Alonso and Quinde (2023), Overreliance on ChatGPT may considerably diminish opportunities for teacher-student interaction and collaborative knowledge construction thereby undercutting the transformative potential of education. Therefore, integrating ChatGPT into educational contexts requires critical reflection and careful consideration by educators to align with Freire's ideals of empowerment and critical consciousness.

The advent of ChatGPT presents exciting prospects for cultivating students' abilities to analyze, evaluate, critique, and draw reasoned conclusions even with limited information, thereby enhancing learning experiences (Ying and Daniel, 2023). Given the indispensable nature of these skills in student's daily lives,

future careers, and higher education, thoughtfully integrating ChatGPT and related technologies into classrooms holds immense promise for advancing educational practices in the digital age.

Drawing from Freire's educational concepts, scholars have previously scrutinized the incorporation of technologies like learning management systems (LMS) and online platforms. For instance, Boyd (2016) applies Freire's problem-posing approach to critique LMS such as Blackboard, highlighting how they can perpetuate power imbalances and transactional learning. Similarly, Farag et al. (2022) use Freirean principles to examine how LMS monitoring and data-driven metrics may reinforce oppressive systems. However, both also identify opportunities to leverage educational technologies in ways aligned with Freire's humanist pedagogy, fostering consciousness-raising and empowerment.

While ChatGPT presents transformative potential in education, it risks aligning with banking models of learning. Freire's concepts prompt us to consider how ChatGPT can be integrated to serve emancipatory aims (Barrot 2023). For instance, ensuring that ChatGPT facilitates contextualized learning experiences and preserves learner agency are crucial considerations. Moreover, questioning biases in ChatGPT training data aligns with Freire's commitment to consciousness-raising, enabling educators to navigate potential pitfalls and maximize the technology's benefits.

Methods and Analysis

The study recruited a sample of high school educators who had enrolled in a study program at the graduate school at the University of Southern Indiana (USI). A purposive sampling strategy was used to select 24 educators who had taken a course in critical pedagogy at USI and had previously interacted with the concept of ChatGPT in their professional lives. A convenience sampling strategy was used to recruit an additional 50 educators within the professional circles of the researchers spread across the US. A total of 74 respondents were thus used in this study.

To test a null hypothesis of no significant relationship between ChatGPT and critical Pedagogy, the study used Pearson Linear Correlation Coefficient (PLCC), and the results were as found in Table 1 below:

Table 1: Pearson Linear Correlation between the use of ChatGPT and the deployment of critical pedagogy

Variables	Sample size	Sample mean	Sample std Deviation	r-value	Sig.
ChatGPT	74	2.45	0.317	0.031	0.114
Critical Pedagogy	74	2.03	0.429		

To establish a criterion for a decision, the level of significance for this study was set at 0.05. A test statistic was computed to test for the 'r' value, which is the actual probability of obtaining a sample outcome if the null hypothesis is true. A null hypothesis is usually rejected when the r-value is less than or equal to .05, implying that the effect reached significance. A null hypothesis is retained if 'r' value is greater than or

equal to .05, implying that an effect failed to reach significance. It is evident that in this particular case, r=.031, and sig =0.114 hence the null hypothesis is rejected and its alternate accepted leading to the conclusion that there is a positive relationship between the use of Chat GPT and the deployment of critical pedagogy.

Discussion

With the incorporation of artificial intelligence (AI) into the field of education, significant changes have come along to streamline educational processes. Jara and Uso (2021), argue that this has been evident through the facilitation of global learning, the customization of learning experiences, the development of smarter content, and the enhancement of educational administration in terms of efficacy and efficiency. Garcia and et. al., (2020) also argue that in the present era, new technologies play a pivotal role in helping to optimize the teaching-learning continuum. It can be argued that education transcends being a mere commodity today; it evolves into a dynamic process where learning extends beyond mere knowledge acquisition. Therefore, artificial intelligence (AI) emerges as a potent technological tool in the educational domain, offering the potential to foster personalized learning tailored to the unique needs and interests of individual students as maintained by Wang (2019).

By employing this sophisticated conversational tool in education, the learning process is elevated to new heights, giving the learning community a unique opportunity for untold growth and collaboration. Chat GPT has therefore presented limitless opportunities in education. The personalized learning experiences it affords, instant and continuous assistance functionality, coupled with its ability to author educational content are testament to its ability to impact teaching and learning. For instance, according to Lee (2023), Chat GPT can support educators in generating assignments, quizzes, and questions. This is besides its ability to offer gamification and simulated teaching environment of educational content which may help with differentiation of instruction. Lee (2023) further contends that as technology continues to advance, the integration of ChatGPT into simulated teaching environments holds great promise. Educators can use language models to practice lesson planning, classroom management, and interactions with virtual students. This simulated approach provides a risk-free space for teachers to refine their skills, experiment with different strategies, and gain confidence before entering the actual classroom setting

AI has revolutionized various facets of daily life, progressing from simple human-like behaviors to sophisticated applications such as machine learning and neural networks.

ChatGPT holds immense potential as a tool for fostering critical consciousness in education. Therefore, even as educators continue to explore more innovative ways to integrate AI technologies into the classroom, it is very imperative to harness the power of ChatGPT in promoting thoughtful engagement and social awareness among students. As Ying and Daniel (2023), contend, there is a critical need for strategies to effectively train and capacitate all educators on how to integrate ChatGPT into their teaching

practices, ensuring that they possess a deep understanding of how Large Language Models (LLMs) like ChatGPT operate to provide appropriate guidance and support to the students.

Promises of ChatGPT and how it intersects with Critical Pedagogy

From the study findings, educators and students alike should have an open mind regarding how they could use this tool. ChatGPT can be viewed as an opportunity and thus many learning opportunities could be leveraged. The most significant contribution of ChatGPT to education is the facilitation of personalized learning experiences. According to Bernius et al. (2022), traditional education often struggles to cater to the diverse learning needs of students. However, with ChatGPT, students can receive tailored explanations, additional resources, and individualized support. The model presents the potential to adapt to each student's learning style, pace, and preferences, providing a level of customization that was once unimaginable. It seems to be the case, therefore, that this personalization not only enhances understanding but also fosters a deeper engagement with the learning process. From the forgoing submission, it is evident that Chat GPT seems to be pivoting educational processes in the critical thinking path as the teachers focus on the key ideas only.

In this digital age, advancements in artificial intelligence (AI) has revolutionized many aspects of our lives, including education. ChatGPT, developed by OpenAI, is significantly a notable example of AI technology that has received attention for its potential in educational settings Alonso and Quinde (2023). However, beyond its helpfulness in facilitating learning tasks, ChatGPT also holds promise in promoting critical consciousness among learners. Critical consciousness, a concept championed by the Brazillian educator Paulo Freire, emphasizes the importance of recognition of and the challenging of oppressive social structures, Freire (1970). It should be worthwhile, therefore, reflecting on how ChatGPT can catalyze fostering critical consciousness in teaching and learning.

Cooper (2023) asserts that ChatGPT's conversational capabilities provide students with a unique opportunity to engage in critical inquiry. By posing open-ended questions and encouraging deep reflection, this program invites students to critically analyze and challenge common assumptions, fostering critical thinking skills. It can therefore be inferred that through dialogue with ChatGPT, students can explore complex issues from multiple perspectives, ultimately leading to a deeper understanding of the societal dynamics as it is and the power structures within. Barrot (2023), also contends that like all AI technologies, ChatGPT is not immune to biases present in its training data. However, by critically examining the outputs of ChatGPT, students can analyze biases in language, representation, and perspectives Watanabe (2023). This process encourages them to question dominant narratives and challenge societal norms. By unpacking the biases embedded within ChatGPT's responses, students could develop a heightened awareness of how content concepts shape our understanding of the world around us. Although Giroux (2010) did not explicitly delve into the integration of technology in teaching and learning, he points out the critical need for an education that promotes multiple viewpoints and encourages students' understanding of prevailing social issues. Against this backdrop, one of the strengths

of ChatGPT lies in its ability to generate responses that incorporate diverse multiple perspectives and viewpoints. By exposing students to a range of voices and experiences, therefore, ChatGPT broadens their understanding of social issues and fosters empathy and solidarity, a view that strengthens Paulo Freire's quest in the Pedagogy of the oppressed. Through these interactions with ChatGPT, students learn to appreciate the richness of diversity and recognize the essence of amplifying marginalized voices.

Conclusions and Recommendations

Even when it has been received with mixed reactions, schools should see the hopes that come with ChatGPT and harness them. By banning ChatGPT completely, schools could entrench authoritarian practices that undermine democratic practices in Education, and as Bell Hooks contend in Teaching Community (2003), authoritarianism in academic settings dehumanizes and thus shuts down the 'magic' that is always present when inclusive pedagogical practices are involved. It takes the fun out of studying and makes it repressive and oppressive p43. It is prudent therefore that the concept of ChatGPT be thoroughly understood so that educators can make informed decisions.

ChatGPT-like all AI tools have its limitations, and so there is a need for reliance on students own creativity in creating authentic content, and in developing their critical thinking skills with the support of AI tools. As an attempt to meaningfully socialize ChatGPT, students should be afforded the freedom to individually explore ChatGPT while reinforcing the notion that it is not a substitute for stepping up and doing the human part. This will ensure that they even double-check the content generated by ChatGPT for facts.

Chat GPT brings both new opportunities and new complexities. AI is man's next best friend that is here to stay. Stakeholders in education must accept that technology, including tools such as ChatGPT, are tools for augmenting education and not a replacement for traditional teaching methods. These tools have significant potential for disruption. Granted, some concerns are still being explored that are associated with this nascent technology Mollick (2023). Educators must therefore embrace these innovations responsibly and integrate them purposefully into the environment of learning. This will enable the society to harness their potential to enhance and enrich the teaching-learning experiences. Being a work in progress, efforts should be made to study ChatGPT's responsible usage anchored in principles of reliability, equity, transparency, and above all *primum non nocere*. AI in the classroom requires new competencies and considerations from educators. As can be seen in this paper, educators can only ignore ChatGPT at their peril. They must start engaging with it in a meaningful way as an assistive technology, aware that we cannot take the human operator out of ChatGPT. Even then, there is still a potential for ChatGPT to reproduce certain social biases and inequalities. The biggest question then is how this can be handled.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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