Graduate Teacher Education Students Use and Evaluate ChatGPT as an Essay-Writing Tool

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Abstract

Artificial intelligence (AI) has been evolving since the mid-twentieth-century when luminaries such as Alan Turing, Herbert Simon, and Marvin Minsky began developing rudimentary AI applications. For decades, AI programs remained pretty much in the realm of computer science and experimental game playing. This changed radically in the 2020s when commercial vendors such as OpenAI and Google developed generative AI programs (ChatGPT and Bard) using large language modelling (LLM). As a result, generative AI is now being considered for use in all walks of life, including education. In spring 2023, when ChatGPT burst into the public psyche, twenty-five education students in the author's graduate seminar were invited to participate in a qualitative study using ChatGPT as an essay-writing tool. Fifteen accepted the offer. The purpose in doing this was to give students in this seminar the opportunity to use ChatGPT in a supportive environment and to collect qualitative data via descriptive written evaluation and a focus group to comment on their experiences using ChatGPT. All of these students have master's degrees in education and experience as teachers in New York City schools. Their training and experience give them keen insights into pedagogical practice making them ideally suited to evaluate ChatGPT as an essay-writing tool. This article reports on the results of this study. Key findings indicate that the vast majority of these students had a good experience in using ChatGPT for their essays. Many, especially the secondary school teachers, would use it in their own classes.

Introduction

In a recent book, Mustafa Suleyman (2023), the co-founder of DeepMind and a major voice in the field of artificial intelligence (AI), commented that humanity stands at a turning point in its history. He compares the development and deployment of AI to the discovery of fire, the invention of the wheel, and the harnessing of electricity. He sees the potential of AI technologies as vast, profound, and capable of unlocking the secrets of the universe, to say nothing of its effect on our daily lives (Suleyman, 2023). There is little doubt that some aspects of Suleyman's predictions will occur; the question is when. Neither he nor anyone else can answer this difficult question.

Various forms of AI have been evolving since the middle of the twentieth century. Luminaries such as Alan Turing, Herbert Simon, and Marvin Minsky made significant contributions to the

field. For decades, AI programs remained pretty much within the realm of computer science and experimental game playing. However, the twentieth century brought major AI development as mega corporations such as Apollo (Google's parent company), Microsoft, Apple, and Amazon started making billions of dollars in investments in this technology. These investments bore fruit in November 2022, when OpenAI launched its generative AI program, ChatGPT, using large language modelling (LLM) software. ChatGPT and other generative programs such as Google's Bard and Lensa AI have now brought AI to the masses. As a result, generative AI is now being used in all walks of life. The number of job postings mentioning GPT or ChatGPT on LinkedIn grew 21-fold in nine months since the chatbot was released in November 2022, according to a report on AI in the workforce. Postings for AI engineers more than doubled between April and June 2023, making it the third-fastest growing job on the platform (Kimbrough et al., 2023). "AI" was named the word of the year for 2023 by Collins Dictionary.

   The purpose of this article is to report on the use of a generative AI program, ChatGPT, by a class of graduate teacher education students. In spring 2023, when ChatGPT attracted a good deal of public attention, 25 education students in the author's graduate seminar were invited to participate in a qualitative evaluation of the use of ChatGPT as a tool for completing an essay assignment. Fifteen (N = 15) students accepted the offer. The purpose of this exercise was twofold:

- To give students in this seminar the opportunity to use this new AI software in a supportive environment.
- To collect qualitative data from them on their experiences using the software.

All of these students have master's degrees in education and experience as teachers in New York City schools. Their training and experience give them keen insights into pedagogical practice, making them ideally suited to evaluate ChatGPT as an instructional tool. This article will report on their evaluations.

   For the purposes of this article, it is important to define generative AI as well as distinguish it from general AI. AI is a broad field or science in which machines are taught to develop humanlike capabilities. General AI occurs at the point when AI can learn human cognitive skills (Suleyman, 2023, p. vii) and is still years away from full development. Generative AI, on the other hand, is here now. It is a technology within the field of artificial intelligence that uses neural networks, similar to the human nerve system, to generate new and original content. It can produce a wide variety of data, including text, images, audio, and video. Generative AI can also create content, such as synthetic data, code, simulations, and more by identifying patterns and structures within existing data. Generative AI builds upon technologies like large language models (LLMs), which are trained on vast amounts of data, enabling them to predict and develop data such as original images or text structured in sentences and paragraphs. This article focuses specifically on the use of a generative AI program, ChatGPT, that is currently being used by millions of people throughout the world. The GPT in ChatGPT stands for "Generative Pre-trained Transformers." It is a large language model (LLM) that is based on the concept of a *transformer,* first introduced in 2017 by researchers at Google (Vaswani et al., 2017). A transformer derives meaning from long sequences of text to understand how different words or semantic components might be related to one another, then determines how likely they are to

occur in proximity to one another. These transformers are run unsupervised on a vast corpus of natural language text in a process called *pretraining* (that's the *P* in GPT), before being fine-tuned by human beings interacting with the model.

Review of the Literature

Since generative AI, especially in the form of ChatGPT, became popular in the general public only in late 2022, its research base is growing. Material, mostly in the form of reviews of its deployment in education has begun to appear. For example, Bahroun, Anane, Ahmed, and Zacca (2023) in a review of 207 papers concluded:

> This review paper presents a comprehensive analysis of generative artificial intelligence (GAI) in education… This study begins with a content analysis that explores GAI's transformative impact in specific educational domains…. The versatile applications of GAI encompass assessment, personalized learning support, and intelligent tutoring systems. Ethical considerations, interdisciplinary collaboration, and responsible technology use are highlighted, emphasizing the need for transparent GAI models and addressing biases. Subsequently, a bibliometric analysis of GAI in education is conducted, examining prominent AI tools, research focus, geographic distribution, and interdisciplinary collaboration. ChatGPT emerges as a dominant GAI tool, and the analysis reveals significant and exponential growth in GAI research in 2023. Moreover, this paper identifies promising future research directions, such as GAI-enhanced curriculum design and longitudinal studies tracking its long-term impact on learning outcomes. These findings provide a comprehensive understanding of GAI's potential in reshaping education and offer valuable insights to researchers, educators, and policymakers interested in the intersection of GAI and education. (Bahroun, Anane, Ahmed, and Zacca, 2023, p. 1)

Other reviews, like Mao, Chen, & Liu (2023); Ahmad, Murugesan, & Kshetri (2023); and Taniga (2023), have a similar focus and conclude that generative AI is enjoying increased use by faculty and students alike. Teachers are using generative AI for lesson planning and to develop curriculum material for classes, according to a national survey conducted by the Walton Family Foundation (2023). Key findings were that 51% of teachers reported using ChatGPT, with 40% using it at least once a week, and 53% expecting to use it more this year. Twenty-two percent of K–12 students said they use the technology on a weekly basis or more (Walton Family Foundation, 2023). A survey conducted by the Pew Research Center in 2023 also found that 20 percent of secondary school students who are aware of ChatGPT use it for their schoolwork (Sidoti & Gottfried, 2023). However, a concern expressed in an ACE Survey Report was that "students with higher academic performance were significantly more likely to use [generative] AI tools than were students with lower academic performance" (Schiel, Bobek, & Schnieders, 2023). Deng and Yu (2023), in a meta-analysis on the efficacy of generative AI on ten instructional factors, found that it could have a significant positive effect on four of the factors including student learning achievement. However, they rejected generative AI effects on the other six. Huang, Hew, & Fryer (2022), in a review of generative AI on language learning, concluded:

"Our findings revealed three technological affordances: timeliness, ease of use, and personalization; and five pedagogical uses: as interlocutors, as simulations, for transmission, as helplines, and for recommendations. Chatbots appeared to encourage students' social presence by affective, open, and coherent communication. Several challenges in using chatbots were identified: technological limitations, the novelty effect, and cognitive load. (Huang, Hew & Freyer, 2022, p. 237)

The major focus of this study is the use of ChatGPT by students as an essay-writing tool. Students may evaluate ChatGPT in this regard for the quality of the essay they produce, its ease of use, its time efficiency, or its help in developing their language skills. ChatGPT might also be evaluated differently depending on the characteristics and abilities of the students. Since ChatGPT only became popularly available in late 2022, the research on it is modest. Basic, Banovac, Kruzic and Jerkovic (2023) in a study of ChatGPT as an assistant for essay writing commented that it is unknown how Chat GPT performs as a student writing tool. They further commented that their study was the "first" that tested ChatGPT as an essay writing assistance tool. One of their important findings was that students using ChatGPT to write an essay did not perform better than students not using it. They also found that ChatGPT did not improve or accelerate their essay-writing time. This is an important comment since it has been assumed that generative AI software would be used as a convenience and timesaver for writing an essay. Fauzi et al. (2023) in a review of ChatGPT literature for improving productivity concluded that students found it provides useful information, it improves time efficiency, and helps improve language skills. Yifan, Mengmeng, & Omar (2023) in a survey of 355 students in five Malaysian universities found that students used ChatGPT because of its ease of use, and convenience for a host of academic activities including writing assignments. They also suggest that:

The combination of ChatGPT and education can provide support for students' papers, assignments, tests, etc.…[it) can also make significant contributions to improving the quality of student productivity, helping university students improve language skills, and providing certain support and motivation. These time-saving methods will enable university students to continue using ChatGPT…ChatGPT can also provide self-directed adaptation services for students with learning disabilities, which helps promote fairness and inclusiveness in education. (Yifan, Mengmeng & Omar, 2023, p. 2187)

Several researchers, Barrot, (2023); Yan (20232); and Zou & Huang (2023), also suggest that ChatGPT can have beneficial effects for second-language students. Song & Song (2023) in a mixed methods study of the impact of AI-assisted language learning on Chinese English as a Foreign Language (EFL) students' writing skills and writing motivation concluded:

"Quantitative analysis reveals significant improvements in both writing skills and motivation among students who received AI-assisted instruction compared to the control group. The experimental group demonstrates enhanced proficiency in various aspects of writing, including organization, coherence, grammar, and vocabulary. Qualitative findings showcase diverse perspectives, ranging from recognition of AI's innovative instructional role and its positive influence on writing skills and motivation to concerns about contextual accuracy and over-reliance." (Song & Song)

To conclude this review of the literature, an important area of concern regarding the use of generative AI is whether the "human" element of teaching and learning may be compromised (Henane, 2023; Lo, 2023; and Global Services in Education, 2023). They raise pedagogical questions related to the social and emotional aspects of learning. For example, Henane (2023) commented: "AI may excel in numerous tasks, but it will never possess the capacity to teach a child how to love, care, express their feelings, and develop their unique personality." Parra (2024) likewise in an article examining "critical conversations" in AI concluded: "We need to focus on the humans and the relationships."

The goal of this research project was to provide a supportive environment wherein experienced teachers who are also graduate students were given the opportunity to use and experience generative AI (as provided by ChatGPT). They were also tasked with evaluating it as a tool for writing essays for themselves and their own students.

Methodology

This study uses qualitative research to evaluate ChatGPT as an essay writing tool. Elements of Creswell's (2009) characteristics for qualitative research were followed, including:

- the use of a natural (class) setting
- collect multiple sources of data
- researchers as instruments
- inductive data analysis
- participants meaning

The participants in this study were enrolled in a required graduate course in the Administration and Supervision Program at Hunter College. The program has selective admission requirements as follows:

- A master's degree from an accredited institution with a Grade Point Average (GPA) of at least 3.0.
- Permanent or professional New York State (NYS) certification as a teacher and/or pupil personnel service provider within grades pre-K–12.
- A minimum of three years of approved teaching and/or school service within grades pre-K–12 under regular appointment (or its equivalent for counselors, social workers, and school psychologists) or two years approved teaching and/or school service and at least one year of relevant management/leadership experience.

The students in this program are generally well-organized, focused on their studies, and have good writing skills. Twenty-five students were enrolled in this course in spring 2023.

The students were offered the option to do an essay (see Appendix A) using ChatGPT. Fifteen students volunteered to use ChatGPT for this assignment. The basic characteristics of these students are:

- Gender: 10 females; 5 males.
- Teaching Level: 7 high school teachers; 4 middle school teachers; 4 primary school teachers.
- Average Age: 32.6 years.

- Average teaching experience: 9.2 years.

To provide a supportive environment as specified above, there was a one-hour introduction to ChatGPT geared to the essay assignment. Students were free to ask any questions about the assignment including the use of ChatGPT. During the semester, there were three progress reporting sessions during which students could also ask any questions they had about the assignment. During these sessions, several students asked for technical guidance about formulating ChatGPT questions.

The two major data collection tools for this study were the student essays and a focus group discussion. The student essays required them to answer a series of questions related to their experiences using ChatGPT (see Appendix A). In addition to preparing the written essay, the students participated in a two-hour focus group discussion after they completed their assignments. The student responses to the questions on the essay and comments made during the focus group discussion were the sources of data for this study.

Findings

The findings that follow contain excerpts of student responses to the prompts that they were required to answer in the assignment:

1. How well did you feel ChatGPT assisted you in completing the assignment?
2. Do you believe that you could have done as good, better, or not as good a paper without using ChatGPT?
3. Would you allow students to use ChatGPT in your own classes?
4. Recommendations and comments on particular K–12 student populations.

These questions also follow from the issues raised in the above review of the literature specifically to those related to using ChatGPT as an essay-writing exercise. Comments that were particularly pertinent or were repeated by more than one student have been italicized. Appendix B has two samples of unabridged student responses to give the reader a better understanding of the depth of their thinking on ChatGPT.

Student Overall Comments

Below are samples of comments from students taken verbatim from their responses on the essay assignment or during the focus group discussion.

Student LAA: I think ChatGPT did a decent job of creating a skeleton for this essay. The writing it produced is coherent and technically sound. It uses language that is appropriate for the task and mirrors academic writing and structure. The content of the essay it produces is dependent on the way you phrase your question. When I entered the prompt for the assignment as it was written, the essay was pretty general and not too dissimilar from what you might read in a newspaper book review. When I tweaked the prompt to be more specific like, "Write a 1500-word essay reviewing Linda Villarosa's

book *Under the Skin*. Identify the key themes/points of view of the author(s) and how they are important to education research," *it produced the beginning of a higher quality essay.*

Student DFF: I believe that without using AI I could have written a similarly strong essay, *but it would have likely taken me more time* to generate my ideas.

Student LRR: Overall, this was extremely helpful in organizing my thoughts and assisting me in planning how I wanted to construct my response. The program did not provide me with any novel insights into the book that I could not garner myself through reading it, but it did help me take such a large amount of information and dilute it to its main points. I suppose I would have done this myself, if not for ChatGPT, *but it expedited the process* and might be more accurate and succinct than my own bulleting key ideas list would be.

Student JRR: ..it helped me overcome writer's block by providing new ideas and fresh perspectives on the novel. .. It provided ways to find and access a wide range of sources and references. .. ChatGPT provided suggestions for improving the flow, structure, and coherence of my essay, *helping me to refine my writing skills and produce well-crafted work.*

Student GSS: I found ChatGPT to be the most useful for summarizing the key points and finding relevant quotes for analysis. These are fairly objective tasks, so ChatGPT's output was a more than sufficient substitute for my own work. In fact, the AI has the edge here because it was able to complete these two tasks much more quickly than I could (instantaneous vs. needing some thought and chew time). While I have confidence that I ultimately would have been able to do as good or better of a job at this area of the task, ChatGPT wins in this scenario because it cut down my time working on the more cut-and-paste tasks and left me with more energy to engage more deeply in my own analysis….*ChatGPT is insufficient, however, when it comes to offering opinions on topics, or actually engaging with the quotes it found.*

Student MEE: *I could have written a better paper without using ChatGPT* because the intelligence only came up with what I asked it to do. I would have been more impressed if it did not require me to specifically tell it to write the text using imagery as the focus.

Student SMM: *What I felt was missing from ChatGPT's responses, and what I added, was a deeper analysis of the text and more thoughtful and critical connections to the work of contemporary scholars within educational research today.* That said, I could have likely continued to pose more questions or prompts to ChatGPT to elicit a more detailed response. However, I wished to make those connections myself in order to deepen my own understanding and push my own thoughts and reflection.

Student SHM: I recognize ChatGPT's review as failing to appreciate or even identify the utility of the eight approaches that Rollins has successfully introduced in classrooms where acceleration is favored over remediation. Despite its repeated use of the word

"engaging," ChatGPT shows an inability to engage in the higher-order thinking required to cite any level of detail in comparing, contrasting or distinguishing between instructional strategies that Rollins has found in classrooms that have successfully embraced acceleration and those that have defaulted to remediation. Instead, the chatbot refers vaguely to the "importance of creating a learning environment that is both challenging and engaging" and "the need to scaffold instruction and differentiate learning to meet the needs of all students" with "graphic organizers, cooperative learning, and task rotation." *None of this generic information would help an educator or administrator decide whether Rollins offers anything that would be of value in a classroom. In short, ChatGPT barely reaches the second level of Bloom's Taxonomy.*

Several themes recurred in the above. First, most of the students had positive experiences. For example, student DFF commented that ChatGPT helped refine their writing skills and helped to develop the beginning of a "high-quality essay." Student JRR commented "... ChatGPT provided suggestions for improving the flow, structure, and coherence of my essay, *helping me to refine my writing skills and produce well-crafted work.*"

Second, three students (DFF, LRR, GSS) mention the efficiency of using ChatGPT. Student DFF stated "I could have written a similarly strong essay, *but it would have likely taken me more time* to generate my ideas."

Third, several students, while finding aspects of ChatGPT beneficial, also expressed reservations. Student SMM stated: "*What I felt was missing from ChatGPT's responses, and what I added, was a deeper analysis of the text and more thoughtful and critical connections to the work of contemporary scholars within educational research today.*" Student MEE commented: *"I could have written a better paper without using ChatGPT."* Student SHM was very critical of OpenAI and compared its output to the lower rungs of Bloom's Taxonomy.

Would You Allow Students to Use ChatGPT in Your Own Classes?

Student LRR: I am a second-grade teacher, so *ChatGPT isn't very relevant.*

Student OMM: I would consider allowing students to use this for writing assignments, but *I would hesitate with my middle schoolers. We already have a ton of plagiarism issues* because the students don't fully understand how to use sources instead of copying/pasting google searches.

Student WPP: I teach IB History and recently the International Baccalaureate established a policy allowing students to use and cite ChatGPT in their writing. As a result, *I would allow students in my class to use it for their work as long as they follow the proper parameters in citing the work.*

To summarize, the high school teachers would be willing to experiment with using ChatGPT, the primary and middle school teachers less so.

ChatGPT and Specific Student Populations

The following responses reflect a variety of thoughts on specific student populations.

Equity

Student SMM: I am undecided on whether or not I would *consistently* allow my students to utilize ChatGPT. On one hand, I think it removes barriers for many students who have reading problems and grapple with a text, and who may be struggling to synthesize their ideas, connections, and analysis of the text. To that end, Chat GPT could provide access and entry points to rich and complex texts for many students who may otherwise avoid such literature or topics. *It could be seen as a vehicle for equity in classrooms and institutions.* On the other hand, perhaps it removes the work of critical analysis for students, and requires too little of them, and may end up stymying their ability to become critical-thinkers and change-makers.

ESL Students

Student KAA: I feel that Chat GPT has the power to be an extremely useful tool for ESL students or students who are writing below grade level. *It is very helpful to be provided a model example and that is not always given to you when given an assignment in school.*

Student ZCC: *I am a Bilingual School Counselor and many of my students are ESL* learners and this tool can be useful for them…, *it can be a good starting point for the learning experience* and students can build and push themselves to dive further into the information while also being critical of the information that is gathered by this tool. I believe educators can find a way to make this tool work for both them and the student's learning experience.

Student MEE: The majority of the students I teach are newly arrived ESL in the United States, as such, writing often causes them anxiety. By using this technology to brainstorm assignments, *it would show them how to write a basic essay and not stare at a blank page, perplexed by what they have to do.*

Math Students

Student KAA: What's interesting to me about the discussion around ChatGPT is that math teachers have been dealing with this issue for over ten years. *When I first started my career in 2014, I quickly learned about "photomath." Photomath is an app that allows you to scan a math problem and it instantly answers the problem for you and provides all steps.*

Special Education

Student KAA: Some of my co-workers have been utilizing ChatGPT *to create IEP goals for their students.* I was amazed with how capable it was at any task it was given which is why I wanted to utilize it for this assignment.

The number of comments about the benefits of ChatGPT for specific student groups was of particular interest. This was explored this during the focus group session and the students were adamant in what they saw as benefits of a generative AI tool for students who struggle with writing in general, for ESL students, and for special education students. This issue will be discussed further in the section that follows.

Discussion

The timing of this study—early in the spring 2023 semester—should be kept in mind throughout the discussion of the findings. ChatGPT had just become popular and many people including the participants of this study were minimally aware of it or any other generative AI tools. For the most part, teachers in K–12 schools and colleges were just familiarizing themselves with this technology with few using it in any meaningful way. Regardless, the majority of the participants in this study found that ChatGPT saved time in writing their essays, was easy to use, and helped generate ideas to get them started. However, several other findings are worth mentioning.

First, some participants found that ChatGPT "provided new ideas and fresh perspectives," "summarized the key points," and "helped take such a large amount of information and dilute it to its main points." Others questioned the quality of the ChatGPT responses and stated that "OpenAI did not provide me with any novel insights" and "ChatGPT is insufficient, however, when it comes to offering opinions." The mix of opinions here represent similar findings in other studies of generative AI. Deng and Yu (2023) mentioned earlier found it had a significant positive effect on only four of ten factors. Basic, Banovac, Kruzic and Jerkovic (2023) in a study of ChatGPT as an assistant for essay writing commented that there were mixed results but that it did not perform better than students not using it. I believe that as these students and others make greater use of ChatGPT and other generative AI programs they will become more proficient in eliciting responses that might better meet their needs.

Second, a number of students complimented ChatGPT's assistance in writing their essays. These comments related to helping with writer's block, getting their writing started, and helping to organize one's thoughts. Even if they thought they could write a better essay, some appreciated ChatGPT's assistance. Some also extended their opinions on ChatGPT's writing to its effect on their own students. They saw it as helping issues of inequity for students who have trouble writing in general especially ESL students whose first language is not English. This is consistent with a number of other studies mentioned in the research literature such as Barrot (2023); Yan (2023); Zou & Huang (2023); and Song & Song (2023). One student, KAA, commented that ChatGPT was being used to assist in writing Individual Evaluation Plans (IEPs) for students with special needs. Recently, there have been a number of articles in the professional media that support the potential of generative AI to address equity issues. Cohen (2023) in a piece for The Core Collaborative sees ChatGPT as a starting point in a pursuit of more equitable educational practices, and

> …its potential is to support neurodiverse students, students from marginalized populations, and students from non-traditional families. It is important to recognize that

achieving true equity in education requires a comprehensive approach and cannot be accomplished by any single tool or solution. However, ChatGPT can play a crucial role in helping us work towards a more inclusive and equitable education system. (Cohen, 2023)

Others such as Hall (2023) have commented that ChatGPT "levels the playing field" for people with disabilities and de Haas (2023) goes so far as to label ChatGPT a "game changer for people with dyslexia" who have trouble writing. However, as mentioned earlier in this article, early research indicated that higher performing students were significantly more likely to be using generative AI tools than were lower-performing students (Schiel, Bobek, & Schnieders, 2023).

Third, Student SMM commented:

What I felt was missing from ChatGPT's responses, and what I added, was a deeper analysis of the text and more thoughtful and critical connections to the work of contemporary scholars within educational research today. That said, I could have likely continued to pose more questions or prompts to ChatGPT to elicit a more detailed response. However, I wished to make those connections myself in order to deepen my own understanding and push my own thoughts and reflection.

They went on to say that "… perhaps it removes the work of critical analysis for students, and requires too little of them, and may end up stymying their ability to become critical thinkers." Several other students, particularly in the focus group discussion, raised concerns about their students becoming too dependent upon ChatGPT for content or for writing. Questions were raised about controlling students' use and possible dependency on ChatGPT. Comments raised about student dependency also segued into the issue of ethics and plagiarism. This is a major issue already for many teachers at any level; ChatGPT might just add to it. It behooves the teaching profession to recognize this and do what it can to advise students about ethical considerations of using generative AI. This might in fact be the major question for years to come as generative AI moves beyond its beginning stages and matures.

Conclusion

Generative AI in the form of ChatGPT entered the consciousness of the world in late 2022. The data for this study was collected in early 2023 when ChatGPT was still a new phenomenon. The findings support other studies conducted on generative AI that concluded that it saved time, helped get the writing process started, and could be beneficial for certain student populations (Fauzi et al., 2023; Yifan, Mengmeng, & Omar, 2023; Song & Song, 2023). The graduate students evaluating ChatGPT in this study, who themselves are K–12 teachers, saw it as a tool that they will have to consider in their own teaching. They will be faced with pedagogical, policy and ethical issues as generative AI becomes part of their instructional repertoire and as expressed by other researchers (Deng and Yu, 2023; Banovac, Kruzic, and Jerkovic, 2023; Huang, Hew, & Fryer, 2022).

Generative AI is still a young technology that is growing in capability and its most significant advances are yet to come. Microsoft and Google are already integrating generative AI into their search engines and other products. In the near future, generative AI will integrate with massive

cloud computing, robotics, and synthetic biology and likely begin to evolve to more general AI with capabilities far beyond the generative model. This integration will occur as digital technology exponentially accelerates, building upon advanced nanotechnology and quantum computing. AI in all of its ramifications will be a focal point as humankind functions in most of its endeavors, including education.

Declarations

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Institutional Review Board Consent

This project was reviewed by the City University of New York Institutional Review Board. Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest

The author declares no conflict of interest.

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Appendix A

Student Book Assignment

Read One of the Following
(The students could select one of twenty books from a reading list. Below is a sample of these books.)

Brady, T. (2021). *Three ordinary girls: The remarkable story of three Dutch teenagers who became spies, saboteurs, NAZI assassins and WW II heroes.* New York: Citadel Press.

Caro, R.A. (2019). *Working: Researching, interviewing, writing.* New York: Alfred Knopf.

Villarosa, L. (2022). *Under the skin: The hidden toll of racism on American lives and on the health of our nation.* New York: Penguin/Random House.

Write an essay reviewing one of the books above. Answer why you selected this book for your assignment and indicate whether it met your expectations. Also make sure to identify the key themes/points of view of the author(s) and how they are important to education research. Conclude your essay with a clear statement on whether you agree with the author's positions. Please write seven pages and absolutely no more than nine double-spaced (Times Roman 12-Font) pages. Due March 6th.

For students opting to use ChatGPT.

ASSIGNMENT NO. 1 ADDENDUM

Assignment No. 1 essentially remains the same as described earlier in this syllabus except that students have the option of using ChatGPT software to assist in writing their papers. Students are responsible for using ChatGPT as best they can.

I would suggest that you start your ChatGPT session with a request as follows.

"Write an essay reviewing (give full citation of the book you are reading. For example: (Blight, D. W. (2018). *Frederick Douglas: Prophet of freedom.* New York : Simon & Schuster.) Answer why you selected this book for your assignment and indicate whether it met your expectations. Also make sure to identify the key themes/points of view of the author(s) and how they are important to education research. Conclude your essay with a clear statement on whether you agree with the author's positions."

You can use the essay produced by ChatGPT as the beginning of your paper. To complete the assignment, you will likely have to write approximately four-five more pages rather than the seven as indicated in the original Assignment No. 1. You can use your own discretion as to how many additional pages you need to complete the assignment. You can ask ChatGPT follow-up questions if you wish.

I would also like you to add one paragraph to this assignment at the end of your paper answering the following as best you can.

How well did you feel ChatGPT assisted you in completing the assignment?
Do you believe that you could have done as good, better, or not as good paper without using ChatGPT?
Would you consider allowing students in your own classes to use ChatGPT for essay assignments?
What recommendation do you have, if any, for other teachers or educators in using ChatGPT?
How old are you in years? _____
How long in years have you been a teacher or otherwise involved in education? _____

Appendix B
Two Samples of Unabridged Student Responses

Sample 1 – Their report was based on Freire, P. (2000). *Pedagogy of the oppressed*.

ChatGPT User Questions and Responses

How well did you feel ChatGPT assisted you in completing the assignment?

As an educator I always have my reservations when it comes to artificial intelligence, AI. On a daily basis I see my students that are high schoolers struggling with basic writing. Instead, they are absorbed in social media feeds and often have difficulty in participating in conversations that are both informal and academic. Therefore, I was unsure if ChatGPT would be another one of those tools that prevent students from thinking critically on their own. I thought to myself would using ChatGPT cause more harm than good.

After using ChatGPT I would have to say that I see it as an extremely useful tool if used with some restrictions. Using ChatGPT allowed me to see if my own interpretations of the text were in alignment with what Paulo Freire was saying about the oppressed and non oppressed classes. It provided me with a starting point on where to begin this essay and how to divide the book's distinct four chapters into distinct sections to comment upon. What I did appreciate is that the AI in ChatGPT noted that it does not have the faculty to take an affirmative stance. Therefore, I believe ChatGPT is a worthwhile place to generate some initial thoughts on a topic. From a teacher's perspective ChatGPT can be used as an entry point for students that struggle with engaging with a topic or need further clarification about. Also, I believe that coming up with how to formulate the question for ChatGPT does require critical thinking from its user. Overall, I would not be opposed to having students use this tool as a source, however I would not allow them to use it as a replacement for writing papers. I still want students to engage in thinking critically about a topic on their own and generate their own opinions. They still need to practice the skills and exercise the standard conventions of English in their academic writing without the support of artificial intelligence. It should be a tool, rather than a crutch or replacement.

Do you believe that you could have done as good, better, or not as good paper without using ChatGPT?

As cliche as it may sound, two heads are better than one, even if one of these heads is artificial intelligence. I do believe I could have done as good of a job on the paper without using ChatGPT because of my own intrinsic motivation. I would have done my own research to see if my understanding of the text was in alignment with other readers and critics. It would take a lot more time and effort, however. ChatGPT provided me with a concise summary of the text and provided me with a blueprint of the major themes that I should not overlook such as how many

of our education systems continue to perpetuate forms of oppression. I think ChatGPT lacked its level of analysis regarding the main themes in the text. Most of the summaries were very surface level without saying if Freire's views were correct or flawed. There is also no direct textual evidence from the text (ex. quotes) in the response.

Would you consider allowing students in your own classes to use ChatGPT for essay assignments?

I would consider allowing students in my own classes to use ChatGPT for essay assignments as a source. For example, I would have students read the material first on their own and then use ChatGPT as a way of checking for understanding. I would not be opposed to having students cite from it, however I still would want students to write their own essays. I fear with heavy reliance on ChatGPT, writing in academic settings may be phased out. Being able to write critically about a topic on your own is essential for college and career readiness.

What recommendation do you have, if any, for other teachers or educators in using ChatGPT?

The recommendation I have for other teachers or educators in using ChatGPT is to use it as a place to create lessons. Have students think critically about how to form questions that yield responses. The act of thinking how to formulate a question makes students engage with the subject matter. Another way to use ChatGPT is to have students comment on the quality and validity of its responses. Are they high quality? Are they biased? Are they incorrect? If we accept everything ChatGPT tells us we become what Paulo Freire feared, empty vessels. ChatGPT becomes a depositor, using a banking method of education. We become the empty vessels that simply receive without thinking.

How old are you in years?

I am twenty-eight years old.

How long in years have you been a teacher or otherwise involved in education?

I have been teaching for seven years.

Sample 2 – Their report was based on Brady, T. (2021). *Three ordinary girls: The remarkable story of three Dutch teenagers who became spies, saboteurs, NAZI assassins and WW II heroes.*

Chat GPT Reflection

I feel that ChatGPT assisted me significantly more than I thought it would on this assignment. When we were first given the ChatGPT option, I instantly knew I wanted to pick that one. ChatGPT is something that has come up in my household many times. My husband works in technology sales and everyone at work has been using ChatGPT to write their emails to potential clients. My best friend works in social media, and she has used ChatGPT to come up with clever ideas to pitch to her clients. Some of my coworkers have even tried to utilize ChatGPT to create IEP goals for their students. I was amazed with how capable it was at any task it was given which is why I wanted to utilize it for this assignment.

While I absolutely understood why I wanted to read this book, I did struggle with its connection to educational research. I knew that only one of the main characters experienced a traditional education and I saw how the German invasion impacted her education. But I was really

struggling with how the book connected to educational research specifically. ChatGPT was able to point me in the right direction and then I was able to follow my own thoughts moving forward. Without using ChatGPT, I may have had to switch books because I would not be able to fully complete this assignment. Because of this, I think using ChatGPT for essay assignments is a good idea. It can help students who are struck and need a little help getting started. However, students must be reminded that when it comes to test day, this resource will not be available to them, and they will have to come up with this information on their own.

What's interesting to me about the discussion around ChatGPT is that math teachers have been dealing with this issue for over ten years. When I first started my career in 2014, I quickly learned about "photomath." Photomath is an app that allows you to scan a math problem and it instantly answers the problem for you and provides all steps. There are also the websites WolframAlpha, Symbolab, and Mathway that can solve equations. At first, we tried to figure out a way to make sure students were not using these resources. However, we very quickly realized this would be impossible once they leave our classrooms. As a result, I always require students to turn in their work with all steps included for their homework assignments. This way, even if a student does utilize Photomath, at least they took the time to copy down the steps and solutions and **hopefully**, they were paying attention to those steps and can remember to apply those steps on a future assessment. If used authentically and correctly, these resources can be **extremely** useful. Photomath, just like ChatGPT, provides a model example for students to use. They can then take that model and edit it to be their own or use it as inspiration for another problem/assignment. These resources are not going anywhere and are most likely only going to become "smarter." Because of this, I feel that we must embrace them.

I also feel that Chat GPT has the power to be an extremely useful tool for ESL students or students who are writing below grade level. It is very helpful to be provided a model example and that is not always given to you when given an assignment in school. Chat GPT allows you to input your prompt and utilize their response as a model example. ENL students can practice their reading and writing skills and format their assignment in a similar way. Besides ENL students, I really think all students would benefit from this. If we teach students the importance of not plagiarizing and teach them how to use ChatGPT to **aid** their writing process, I believe it can be a very successful tool. Of course, the one argument is that students will struggle to come up with their own original ideas and become too reliant on this tool; however, if they use it enough, they'll have a "toolbox" filled with ideas and will most likely be able to recycle one that they have already come across.

Lastly, I believe that when teachers incorporate ChatGPT, photo math or other AI apps/websites, they are letting their students know that they are aware they exist. Not only are they telling them they know they exist, but if they are teaching them **how** to successfully take advantage of the tools and make them their own, it becomes a more positive learning experience. A big issue that I have come across is that the NYCDOE has already blocked ChatGPT from being accessed on their public WIFI's. Because of this, students would not be able to use this in the computer labs or their devices if they are using the school's internet. I'm curious how teachers who are using this in class are getting around this issue.

I am 31 years old, and this is my 9th year teaching. *(I also got my first masters in curriculum development and educational technology, and we spent a lot of time talking about AI and how to not feel threatened by it and instead embrace it.)*