

Artificial Intelligence in Education: How ChatGPT Can Affect Students' Learning and Comprehension of Subject Material

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

In the realm of modern education, where traditional pedagogical methods constantly evolve to meet the needs of an increasingly digital society, one technological marvel stands out: ChatGPT. Imagine a world where students can engage in conversation, ask questions, and receive feedback not from a human tutor, but from an artificial intelligence algorithm capable of comprehending, synthesizing, and generating human-like responses. This is not a scene from a sci-fi novel; it's the reality we inhabit today. ChatGPT, powered by OpenAI's advanced language model, has permeated various facets of education, from assisting students with homework to providing personalized tutoring experiences. But amidst the excitement of this technological revolution, a crucial question looms large: does ChatGPT truly enhance the learning process, or does it present a Pandora's box of potential detriments to educational outcomes? As we embark on this journey of exploration, we delve into the depths of ChatGPT's influence on education, seeking to uncover its true impact on students' academic growth and the educational landscape as a whole. Join us as we navigate the intersections of artificial intelligence and education, where innovation meets inquiry, and where the quest for knowledge knows no bounds.

Surely, nothing can truly replicate the humanity present in mankind, right? Take for instance, the first paragraph of this paper, which was entirely generated by ChatGPT. Did you notice? The rise of artificial intelligence in the twenty-first century has changed daily activities. Households can use Amazon Alexa, a virtual assistant, to play music, create shopping lists, tell the weather, and play trivia games. Businesses have utilized artificial intelligence to act as virtual assistants for their websites and handle incoming phone calls. Popular social media outlets, such as SnapChat, have used artificial intelligence to generate images and lookalikes of users. ChatGPT is an artificial intelligence chatbot that can answer almost any prompt given.

ChatGPT can write essays, generate code for projects, and has even passed AP exams. ChatGPT has been used in education by teachers to generate lesson plans and grade papers. Students have turned to ChatGPT to receive explanations on difficult topics in an easy manner and to generate practice problems for studying. I myself, a university student, used ChatGPT to generate the first paragraph of this paper.

However, there have been concerns that students can use ChatGPT to complete their assignments for them, which raises the question of academic dishonesty. Plagiarism and artificial intelligence detectors are often inaccurate and fail to detect work that has been completed by ChatGPT (Lo, 2023). Students are skipping key milestones needed for them to understand and learn subject material by employing ChatGPT to complete their work. For students to effectively study and learn, they must be challenged with problems of the right difficulty (Willingham, 2021). However, by using ChatGPT to directly receive the answers in a quick and efficient manner, students reduce their cognitive load and do not learn the material. Additionally, students using ChatGPT to help them learn subject material instead of working in groups with other students and asking teachers questions can be detrimental to the development of their social skills.

How can ChatGPT affect students' learning and comprehension of subject material? This paper answers that question by analyzing interviews with current college students to study how they use ChatGPT, how often they use it, and if ChatGPT helped them learn subject material. From my analysis, I found that ChatGPT can hinder or help the education of students depending on how they utilize ChatGPT.

Background and Significance

Education has continuously transformed and evolved by adopting and incorporating new innovations in technology. From hornbooks to projectors, and typewriters to laptops, institutions are constantly changing to improve their education system by adopting more effective advancements in technology to enhance students' ability to learn and understand subject material ("The Evolution of Technology in the Classroom", n.d.). ChatGPT is an artificial intelligence chatbot model developed by OpenAI that "is trained on a massive amount of internet text data and is able to generate human-like text" and "has the ability to understand and interpret the meaning of text" (Adeshola and Adepoji, 2023). Given most prompts, ChatGPT can produce what appears to be a detailed, human-like response, although it may not always be correct due to the data it was trained on being inaccurate or outdated, as the latest information it was trained on was up to January 2022.

ChatGPT has been an influential part of education since its creation due to its unique ability to be applicable to any subject. Teachers can give ChatGPT the grading rubric for an essay and have the AI grade their students' essays with detailed feedback, leaving more time for them to work one-on-one with students. Students can give ChatGPT a piece of code and make it identify bugs, as well as hold a conversation with ChatGPT to practice grammar skills. Students can study subject material by using ChatGPT to generate sample problems and explain key concepts. ChatGPT's ability to apply itself to multiple subjects of different formats has led to its inception in education.

ChatGPT's competence in multiple fields of knowledge has encouraged students to use the program to complete classroom assignments. Students can ask ChatGPT to write essays with specific prompts and obtain answers to homework without having to do the work themselves. By having the artificial intelligence chatbot complete their work for them, students are committing

academic dishonesty for submitting work that is not their own. This often goes unnoticed because ChatGPT can bypass most plagiarism detectors, and other tools and algorithms to detect AI-written tasks are not accurate (Lo, 2023). Students using ChatGPT to complete their homework assignments are not challenging themselves to make learning meaningful, which can make it harder for the student to understand and master the material. For students to effectively learn and understand new material, their education must have challenging activities to help commit the information to memory. Neuroscientists have found that when students work on problems that are of the right difficulty – not too challenging or too easy – the brain rewards itself by releasing a naturally occurring chemical in the brain’s pleasure system (Willingham, 2021). Having students work on problems that are challenging but solvable will result in them enjoying the homework assignment and having greater satisfaction in its completion.

With the proliferation of ChatGPT in education, many have questioned whether ChatGPT is helping students learn, since students can use it to understand concepts but also as a crutch to easily get direct answers to their homework, which would not stimulate their brain and help them understand the material. By using ChatGPT, students can make it “difficult for educators to provide targeted feedback and develop necessary intervention strategies. Consequently, the educational process becomes less effective and the true purpose of teaching and learning is compromised” (Grassini, 2023). If a student is struggling with an assignment and they turn to ChatGPT to produce the answers for them, the student is not receiving help understanding the material, but rather bypassing the system of asking their teacher and peers for assistance and going directly to the answer. This can be detrimental to the student’s education as the teacher is unaware that their student is having trouble learning the material, and the student will likely not get the help they need unless they ask the teacher directly.

Utilizing ChatGPT for answers to prompts and questions can also hinder one's social skills. The process of using ChatGPT involves a single user, the one who gives ChatGPT prompts, and the artificial intelligence program itself. Social skills are commonly developed through talking to other people in real life, which help dictate how one acts and talks. Although ChatGPT gives human-like responses and is trained to respond with human-like text, it cannot replace the social and verbal cues learned by participating in a real conversation. Moreover, the most effective ways in which humans learn are experience, social interaction, and training (Reynolds and Mason, 2002). Through communication, students can develop a deep analysis and understanding of the topic they are studying by seeing it from different perspectives. The integration of ChatGPT within classrooms may limit social interaction and thus lower the quality of students' learning experience and the development of social skills.

Methodology

To answer my research question of how ChatGPT can affect students' learning and comprehension of subject material, I interviewed current college students – as of Spring 2024 – at the University of Virginia by having them answer a series of questions from an online questionnaire. Each response was recorded anonymously. Questions asked during the interview consisted of how often they use ChatGPT, why they use ChatGPT, what classes they use ChatGPT for, and if ChatGPT is used more as a source for understanding and studying concepts or for completing assignments. The responses to these questions were used to analyze whether students felt that ChatGPT had improved their learning and educational experience. The questions posed to the students were a mixture of multiple choice and free response to allow for more insight into the students' answers. The responses to the questionnaire also helped to measure the impact and prevalence of ChatGPT in the field of education. The popularity of

ChatGPT in education has risen to the point where class syllabuses now dictate policies for using generative AI on assignments. Studying how college students are affected by the rise of ChatGPT in society, as well as how it influences their edification and study habits, provides a well-rounded understanding of how students are incorporating innovative technology in their education during an era in which generative AI tools are relatively new.

To examine the relationship between students and ChatGPT, I applied actor-network theory to the results of the questionnaire. Actor-network theory is the study of a network involving human and non-human actors to understand how they influence and shape each other (Nickerson, 2024). In the context of this paper, actor-network theory will be used to analyze how students and ChatGPT interact and influence each other to change the field of education. The main actors are students and ChatGPT, with secondary actors being teachers, and various learning formats. The connections between these actors create a network that evolves the field of education. This analytical framework helps to investigate how ChatGPT has impacted the education of students through their design of answering prompts, as well as how students have extended the capabilities of artificial intelligence by using ChatGPT. Furthermore, the actor-network theory helps to analyze how students have changed their education to include ChatGPT, and how ChatGPT has benefitted or harmed their learning. By applying this analytical framework to the results of the series of interviews and surveys conducted on college students at the University of Virginia, we can see how students employ ChatGPT in their education and whether ChatGPT is beneficial in helping them learn subject material.

Literature Review

A person's knowledge is based on their memory. Thinking is slow, unreliable, and takes effort. Thinking takes concentration; you cannot think about something else while you are

working on a problem. That is why “when we get can get away it, we don’t think. Instead we rely on memory. Most of the problems we face are ones we’ve solved before, so we just do what we’ve done in the past” (Willingham, 2021). During the learning process, we are consistently reinforcing and building upon prior skills. With practice, topics become easier to understand and apply to other concepts because we become more reliant on our memory. That is why “a critical feature of effective teaching is that it elicits from students their pre-existing understanding of the subject matter to be taught and provides opportunities to build on – or challenge – the initial understanding” (Bransford and Cocking, 2000). To comprehend the subject matter, people must draw upon their knowledge of the topic so they can connect with the material. From there, people can build onto or correct their initial knowledge with new information, using their memory as a guide.

There is a difference between knowledge and usable knowledge. Knowledge is the memorization of facts, whereas usable knowledge “supports understanding and transfer (to other contexts) rather than only the ability to remember” (Bransford and Cocking, 2000). Concepts that remain in long-term memory are ones that build on patterns (Bransford and Cocking, 2000). Knowledge is useful for examinations where questions require the test taker to remember specific facts. However, usable knowledge stems from a person’s understanding of the material and their ability to apply it elsewhere, such as applying one’s knowledge of addition and multiplication to learn algebra. Concepts that are easy to store in memory are those done repetitively or learned through identifying familiar patterns. The emotional interest of a person also influences their learning ability. Take, for instance, mistakes students make on an exam. Students tend not to remember the questions they answered correctly, but rather the ones they missed. This is because “mistakes are a valuable source of learning. They are evidence of

practice, of action and experimentation...mistakes create authentic and often very personal experiences for individuals to reflect upon, grow to understand, and draw lessons from for future actions” (Reynolds and Mason, 2002). From analyzing their answers, students develop an understanding of why they answered the way they did, where they went wrong, and why the right answer is the correct one. This improves their previous understanding of the material so they will not make the same error next time. Receiving feedback allows students to reflect on their thought process and revise their work, helping them reach a deeper understanding of the material (Driscoll, 2002). Knowledge is also developed from a person’s success. People enjoy mental work if it is successful; “working on problems that are of the right level of difficulty is rewarding, but working on problems that are too easy or too difficult is unpleasant” (Willingham, 2021). People take pleasure in solving problems if it challenges them at the right difficulty level. Yet, if a person is given too many hints, they will not receive the same satisfaction in solving the problem, as they will not feel like the work was their own (Willingham, 2021).

The most impactful person in one’s learning experience is the learner themselves. Self-driven achievement is a powerful motivator of learning because the learner must apply themselves to their studies (Reynolds and Mason, 2002). There is no magic button that automatically downloads information to our brain, rather we must work for it. We have discussed that knowledge comes from repetition, patterns, and emotional response. Knowledge also stems from activities. Experience allows for people to directly participate in an activity and apply their knowledge to a real-life scenario. The connections developed between the activity and information from memory help people understand subject material. People can also learn through communicating and observing others’ behavior (Reynolds and Mason, 2002). Communication develops a personal experience that connects the learning methods of experience and emotional

response. Observation of others' behavior provides an indirect experience that informs the learner of correct responses to actions and encourages repetition of desired behavior.

Given the learning methods discussed, the inclusion of ChatGPT in education has instigated the following question: How can ChatGPT affect students' learning and comprehension of subject material? Learning builds on pre-conceived notions that are already in memory. ChatGPT can provide a personalized learning experience by "analyz[ing] a student's learning patterns and preferences and recommend[ing] specific learning resources that are tailored to their needs. This can help students to learn at their own pace and in a way that works best for them" (Božić and Poola, 2023). ChatGPT can tailor to each individual students' needs, such as by helping them learn through adding onto concepts already stored in their memory. Individualized tutoring provided by ChatGPT allows for adaptive learning, "where education is tailored to accommodate individual learning styles and progress" (Grassini, 2023). The personalized experience ChatGPT offers provides immediate feedback for students to reflect on and helps to identify topics the student struggles with. Students can learn and understand concepts quicker through AI's support and can garner resources for topics they have trouble on. Students can also improve their writing skills by having ChatGPT provide feedback on their grammar, punctuation, and spelling errors (Božić and Poola, 2023). ChatGPT provides the additional service of playing the role of a classmate and a teacher, both of which are essential towards providing a personalized social experience to the student. Students can learn through communicating with ChatGPT and through repetition by asking ChatGPT to provide study questions for specific topics.

ChatGPT can help students directly by answering prompts, but also by reducing teachers' workload. Teachers can use AI to "grade essays and other written assignments

automatically...[and to] generate prompts and questions for classroom discussions, which can encourage students to think critically and engage in meaningful discussions” (Božić and Poola, 2023). By having ChatGPT cut the amount of time spent grading and creating assignments, teachers can spend more time teaching students, answering questions, helping individuals, and providing a personalized educational experience. Furthermore, ChatGPT can produce lesson plans and prompts for teachers to build from to enhance students’ edification. Not only can ChatGPT help students by having them see a different point of view on a topic, but it can also help teachers make their educational experience more interactive, which helps students retain material they have learned.

Although ChatGPT can improve education by providing personalized learning experiences and automating time-consuming tasks for teachers, it cannot replicate the full benefits of a normal classroom environment. ChatGPT is trained using existing digital content, such as videos, images, text, and audio (Grassini, 2023). The data used to train the AI can be inaccurate and hold biases, resulting in ChatGPT generating incorrect responses (Božić and Poola, 2023). Students learn based on knowledge they already know; if ChatGPT tells students inaccurate information, then students may be misled and learn material that is factually incorrect. Moreover, while ChatGPT can converse with students through text, “it cannot replace the social and emotional interactions that occur in face-to-face interactions. Overuse of ChatGPT could lead to a lack of social skills and decreased empathy” (Božić and Poola, 2023). Many basic skills can only be learned through experience, such as social cues during a conversation. People learn how to act and react based on voice tone and body language, such as the emotion expressed on a person’s face. ChatGPT can only replicate the speech portion of a conversation, which can limit a person’s social skills if they solely rely on AI for conversation.

A positive use of ChatGPT is that it can support students' learning by providing personal feedback. This is done through ChatGPT presenting revisions on papers, finding bugs in code, and by explaining topics in an easy-to-understand manner. However, "there is a risk that students may become too reliant on ChatGPT and other AI tools, which could lead to a lack of critical thinking skills and independence in learning" (Božić and Poola, 2023). Students can use ChatGPT for quick feedback and aid on assignments, but relying too much on ChatGPT will make it difficult for them to learn and understand concepts themselves. For instance, students can use ChatGPT to reduce the workload of mundane tasks, such as repetitive questions on homework. Yet, repeatedly solving problems in a subject area is a necessary strategy for learning a concept and storing that information in memory. As people solve more problems of the same type, they will begin to solve them faster in almost an automated fashion. Using ChatGPT to simplify the workload can be detrimental to the students' education and make it difficult for them to understand harder concepts.

Another negative of AI regards students' overreliance on ChatGPT – the possibility of academic dishonesty. In the field of education, there are concerns that "students might not feel the need to develop their own talents if they can just employ AI to do their assignments or projects" (Adeshola and Adepoju, 2023). ChatGPT can answer almost any prompt given and can complete students' homework within the matter of minutes; "the ease with which ChatGPT can produce relatively good-quality text can incentivize students to employ it as a shortcut, thereby contributing to a culture of academic dishonesty" (Grassini, 2023). Students using ChatGPT to generate answers to examinations and homework problems will struggle to understand the material they need to learn. They can likely store some short-term knowledge and memorize facts they need to know, but they will not gain usable knowledge that truly shows their

understanding of the subject matter. To master a concept, students need to be challenged by solvable problems. Furthermore, “students utilizing ChatGPT for their assignments are more likely to engage in plagiaristic behavior than their counterparts who do not use the tools... This may compromise the academic integrity of institutions and challenge the fundamental objective of assessments, which is to gauge and reflect student learning accurately and equitably” (Grassini, 2023). This addresses a new concern that students are not being evaluated on their own skills and knowledge if they submit solutions that were generated by AI (Adeshola and Adepoju, 2023).

A fundamental basis needed for learning is feedback. Feedback is generally given on assignments for students to understand why they answered a question incorrectly and how they can improve; students learn by making mistakes so they will not make the same error again. When a student does not submit their own work, they cannot garner accurate feedback and learn from their misconceptions. Moreover, “it becomes challenging for instructors to discern the student’s proper understanding of the learning material” which “mask[s] learning deficiencies, making it difficult for educators to provide targeted feedback and develop necessary intervention strategies” (Grassini, 2023). Teachers will be unable to detect if a student is having trouble understanding a concept if they are not turning in their own work. This can be detrimental to the student’s learning experience because they will not receive the help they need.

Discussion and Results

The purpose of this paper is to answer the following: How can ChatGPT affect students’ learning and comprehension of subject material? I conducted a study on 31 undergraduate students at the University of Virginia during the Spring 2024 semester, where they were provided a questionnaire about ChatGPT. From the results of the survey, I can conclude that

ChatGPT has both positive and negative impacts on students' learning and comprehension of subject material and has become a prominent influence in the field of education. Of the participants in the survey, 61.3% use ChatGPT. Of those who use ChatGPT, 68.4% of students use it weekly, and 31.6% use it monthly or rarely. This demonstrates that ChatGPT has become common use in daily life. Of the 19 students that use ChatGPT, 52.6% said that ChatGPT has been beneficial to their education overall, whereas 42.1% stated that ChatGPT has been somewhat helpful to their education. Furthermore, 73.7% of those who use ChatGPT use it for understanding and studying concepts, and 42.1% use AI for answering questions on assignments. Many students found ChatGPT to be helpful in their education because it provides a "personal TA" and helps them understand concepts at a deeper level. However, some students rationalized that although ChatGPT was helpful, it came at the sacrifice of their learning at times, as they did not have to understand a concept in its entirety to complete an assignment with the help of ChatGPT, and relying on it too much kept them from learning harder material.

Of the students surveyed, 2 were first years, 3 were second years, 16 were third years, and 10 were fourth years. 67.7% of students were in the College of Arts and Sciences, 29% were in the School of Engineering and Applied Science, and 3.2% were in the School of Education and Human Development. The study group was made up of 20 majors, with 10 students being double majors. The most popular majors among the participants were Computer Science (12 students), English (5 students), and Media Studies (3 students). Of those who used ChatGPT, 84.2% used AI for their classes, with the most common classes being programming courses and classes that require essays.

Students were asked why they used ChatGPT. 68.4% said that they used it for studying and to get explanations on topics. One student stated, "I find it to be a useful tool for

understanding class concepts...I find that oftentimes it can provide a better answer than Google can, since it generates a response more tailored to the query asked of it.” With Google, students must look through multiple sites to find an answer to their question, whereas ChatGPT will display the answer immediately without the user having to search for it. Additionally, one Computer Science student said “CS often has a lot of nebulous concepts that I find hard to truly grasp and it sometimes is very difficult to pay attention/derive the full value from lecture...Due to the large population of CS students, office hours can often be bogged down with a lot of people and help can take exceedingly long...I think that ChatGPT allows you to have a constant access to a help source...and allows for the student to work whenever they want and still have a place they can go to for specialized help.” ChatGPT is helpful in providing assistance to students when they cannot get help on assignments, and for explaining concepts and answering questions students may have. From this standpoint, we can apply Actor-Network Theory to see that ChatGPT has influenced the field of education by providing an extra source for students to rely on. Students are becoming more reliant on AI because it provides responses to queries in a fast, efficient, and easy-to-understand manner that cannot compare with Google. Since students can directly ask ChatGPT questions, this has created a dynamic between students expanding the potential of ChatGPT and the push for ChatGPT to retain more current information to sustain reliability.

The second most popular reason for why students use ChatGPT was to read over papers. 47.4% of respondents stated they used ChatGPT to help reword parts of their paper and assist with grammatical issues. 31.6% of respondents employed ChatGPT for programming purposes, as the chatbot can debug and produce code given a prompt. Other reasons involved summarizing papers students did not have time to read, creating resumes, and curiosity. Students have

expanded the capabilities of ChatGPT by having it assist in essays and help with programming problems. From students' use of ChatGPT in education, they have created a positive feedback loop where as students increase their use ChatGPT, the AI program learns from user interactions to create a more positive, personalized experience for the user. By students bringing attention to the capabilities of ChatGPT, such as essay and code generating, this has created a push to expand the limitations of ChatGPT and train the AI program on more recent data to keep the chatbot's information accurate and up to date. The expanding capabilities of ChatGPT have shown new ways students can approach education.

Students were asked to select all the primary purposes of using ChatGPT that were applicable to them from the following list: understanding and studying concepts, answering questions on assignments, and other. 73.7% selected that they used ChatGPT for understanding and studying concepts, and 42.1% selected the purpose of answering questions on assignments. 4 students selected none, as they do not use ChatGPT for class or they do not use it for those purposes. Of the students that selected both the first two options, they stated that ChatGPT helped them learn topics they did not understand and save time on assignments. However, many of those students stated that they used it more for learning than answering questions since ChatGPT can be inaccurate and produce conflicting responses. One student wrote: "I found it helpful to learn the material myself, and then use ChatGPT as a supplementary resource to check over my working before submitting it. Basically, I learn the material myself, but use ChatGPT as a "second opinion" of sorts in an effort to preserve my grade." This quote demonstrates another influence of ChatGPT in education: the ability for students to check their work. Theoretically, students could check their work before ChatGPT was invented by searching on web browsers, but due to ChatGPT's unique nature of providing direct responses to queries, students can use

ChatGPT to receive feedback and check their assignments. This is useful for students to reflect on how they can improve their work, which increases their knowledge of subject material. Nonetheless, ChatGPT can still provide false information or cause students to develop too much of a reliance on it. This was shown in the responses of students who chose the option that they mainly used ChatGPT to answer questions on assignments. Of the few responses that chose this option, students stated that ChatGPT made completing assignments more efficient but came at the cost of their learning experience, and that using ChatGPT made them lazy since they did not have to learn the subject material to complete the assignment.

Most students chose to use ChatGPT primarily for learning and studying subject material. Students emphasized that it breaks down explanations that professors could not explain in an easy manner, and that ChatGPT helped students understand concepts at a more rapid pace, enhancing students' learning by managing time spent on those concepts more efficiently. Some students stated that they chose this option over using ChatGPT for answers because they do not trust ChatGPT to give them correct answers to assignments. Although ChatGPT is knowledgeable on many subjects, the bias and inaccuracy in the information it was trained on creates the dynamic of users trusting the program enough to explain concepts, but not enough to complete work for them; students are wary about replacing their education with an online chatbot. This can improve students' edification because they can use ChatGPT to explain topics they need more explanation on and use their own knowledge to complete assignments. As ChatGPT becomes more accurate and is trained on new data, the network between ChatGPT and education will become stronger as students trust its abilities more. ChatGPT improves students' education by explaining concepts and giving feedback, but it can also hurt students' learning by

completing their work for them. Students have expanded the capabilities of ChatGPT through exploring opportunities available with AI.

Conclusion

ChatGPT can inhibit or help the education of students depending on how students use AI. ChatGPT can be helpful to students because it breaks down and explains concepts in a way that is easy to understand. This is beneficial when students are confused about concepts learned in class and need a different method to understand the material. The convenience of ChatGPT is that it provides students a resource they can consult when teachers are not available to answer questions. The fast responses given by ChatGPT make it beneficial for students to use timewise so they do not need to wait to talk to their teacher. People have also found ChatGPT to be helpful because it provides instantaneous feedback on their assignments, such as by identifying grammatical issues and rewording items on essays.

However, ChatGPT can be a double-edged sword. People can become too reliant on ChatGPT and use it for all their work, bypassing the need to use ChatGPT to learn material. People can sacrifice their understanding and comprehension of concepts in exchange for ChatGPT's efficiency in completing tasks. This can be harmful to students' education because it takes away the challenging aspects needed to help students learn. Additionally, the assistance of ChatGPT in students' education also poses the issue of academic integrity. ChatGPT has a reliability issue as well because the data it was trained on data that may be biased or inaccurate (Grassini, 2023).

Overall, ChatGPT can be useful as a resource to study and learn concepts but should not be relied on wholeheartedly. Teachers and students can enhance the field of education by

applying ChatGPT to their work to bring out new ideas and different perspectives. To combat cheating, teachers can require students to complete assignments on paper and set clear expectations about academic integrity and the use of generative AI in their syllabuses (Božić and Poola, 2023).

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