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Perils and Opportunities of ChatGPT: A High School Perspective

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Column Editor’s Note: *ChatGPT and other generative ‘artificial intelligence’ technologies have dominated the conversation around education over the past year. There has been much focus on the college level, but high school teachers and students are also affected. To get a quick snapshot of the view from one school, in February 2023 I recruited teachers and students from my local high school. All students received permission from their parents or guardians to participate. I created separate shared documents—one for teachers and one for students—to gather responses to several questions, which are provided at the end of this column. Over the next several months, as these technologies became more prevalent, I worked with the team to synthesize the main thoughts from the two groups. This issue’s column summarizes the opinions of a particular group of high school teachers and students at the start of this stage of the AI revolution. It is not a formal survey, but rather reflects the understanding, thoughts, and reactions of the participants to a topic of much current interest and controversy at a particular moment in time. I make no claim to generalizability, although the points raised here have echoes in the broader societal conversation! In particular, teachers and students alike are looking for guidance on how to incorporate these tools into the high school educational experience in an ethical manner.*

Keywords: high school education, machine learning, technology

Since its introduction on November 30, 2022, OpenAI’s ChatGPT has generated discussion in the popular¹ and trade² press. Much of this discussion has focused on the ways in which ChatGPT and other artificial intelligence (AI) algorithms are disrupting education, writing, and creating, especially at the university level and in business. More overlooked has been another group whose education and careers will be affected by advances in generative artificial intelligence: high school students and their teachers.

To learn about the concerns and expectations of this group, in February 2023 one of us (Lazar) contacted her local high school, State College Area High School in State College, Pennsylvania. She recruited teachers and students who were willing to share their thoughts and current understanding on a variety of questions; see Appendix for the specific questions asked of each group. Once the volunteers were found, documents created in Google Docs were shared separately with the teachers and the students, allowing each set to answer independently. Over the course of a week and half, the participants had the opportunity to respond to the questions, as well as to react to the comments of their peers, a collaborative style of work to which all were accustomed. In this way, we obtained a quick snapshot of the opinions of a small—and not necessarily representative—group of high school students and teachers. We stress that the goal was to get a ‘pulse’ in order to gauge how one slice of the high school population viewed these new technologies as they were starting to become readily available.

Three teachers—an English teacher, a computer science teacher, and a media arts teacher—provided their responses. Seven students, all 11th graders (16 or 17 years old) at State College Area High School at the initial stage of recruitment in Spring 2023 also participated. In what follows, we summarize the themes that arose

from the two discussions. This is not meant to be formal research, but rather a collection of our opinions and ideas. We differentiate between the thoughts of teachers and students primarily where they diverge.

We also note here that ChatGPT and its ilk are large language models, a type of sophisticated machine learning algorithm. These algorithms ‘learn’ from training data—in this case, gleaned from the internet. The definition of (generative) artificial intelligence is somewhat fuzzier, but in popular discourse around these technologies, they are commonly called AI. We use AI and generative AI interchangeably in the rest of the discussion.

We all saw ways in which ChatGPT and similar AI chatbots could be supportive of learning. Teachers mentioned a variety of avenues by which ChatGPT might bring benefits to their students. For example, they thought that it could help support discussion, critical thinking, and collaboration in the classroom or spark ideas for students who may be stuck on a creative assignment. Specific benefits discussed included ChatGPT as a ‘rubber duck debugger’ that can talk back; using a ChatGPT-generated solution as the starting point for further conversation; and brainstorming to show a variety of perspectives on a topic. Other positive uses proposed by the teachers were to model writing for certain types of assignments, to be an extra team member for students looking to push themselves beyond the scope of a class, and to fulfill a tutoring role. For example, if a student had difficulty with some idea or concept when teachers were not readily available (e.g. on the weekend), consulting with ChatGPT could clarify the issue, allowing the student to proceed. We would point out, however, that ChatGPT has been shown to ‘hallucinate’ or make up answers when none are readily available and even in situations where they are (e.g. making up biographical information or research references). Students need to be made aware of this possibility and need to keep in mind that follow-up research will often be necessary.

Students echoed many of these same potential benefits. They saw ChatGPT as a resource to understand topics that they may struggle with in class and to further their knowledge acquisition by going beyond the class content. Also as noted by students, ChatGPT can simplify the process of looking for information, allowing them to spend more time on analysis and synthesis. Some other positive uses that students identified included generating email outlines, simplifying complex questions, and summarizing articles. Like the teachers, students thought that ChatGPT could be helpful as a tutor when they get stuck—for example, if studying for a test, they can get an answer quickly rather than having to wait for a teacher to reply to an email. In addition, ChatGPT could give a different perspective on concepts learned in class. Furthermore, students, like teachers, saw a role for the technology in brainstorming, as a first step in the creative process.

Students also considered the use of these technologies from a social and academic support perspective. For example, many students in the United States take Advanced Placement (AP) courses which, if they do well on the accompanying AP tests, can earn them college credit. Open-ended essay questions on the AP tests in subjects like English and history, such as the rhetorical analysis essay and the long essay question, often have a required structure and format. ChatGPT is adept at composing responses that match these structures and formats, which can be helpful for students with limited access to study guides and other preparatory resources.

As also mentioned by one of the teachers, ChatGPT can provide a model for students on how to engage in certain types of writing.

On the other hand, a significant fear surrounding these technologies, as expressed in the trade press, is the threat posed to academic integrity. Indeed, not long after ChatGPT was introduced, people and companies were already at work on counter-technologies that could recognize when a paper had been written using AI. Notably, these tools themselves are not always accurate, since some writing styles may be more prone to (incorrect) identification as having been machine generated. Certain types of formulaic writing may also be flagged by AI detectors, since both the generators and the detectors rely on probabilities of word combinations. It is thus not surprising that we pointed to issues around cheating as a major peril. We thought, however, that the situation was more nuanced than the simple ‘use of ChatGPT is cheating’ assertion. Respondents from both groups mentioned that context matters, and that AI could be used ethically. Proper citation, for example, was seen as crucial. Students and teachers alike strongly stated that students need to acknowledge when they use these tools in their work. Similarly, copying responses directly was rightly considered to be plagiarism, whether from a ChatGPT-generated response or any other resource that students might have access to.

Students raised a variety of other concerns as well. Several students noted that ChatGPT is not truly a search engine and should not be treated or used as one. It can return false information or make things up. Clearly, if students do not understand that and use it as a pure research tool, they can be misled. The students were skeptical of the credibility of the algorithms and thought that, like with Wikipedia, other sources should be consulted to verify results returned by ChatGPT. This requires awareness about the limitations of the technology and guidance on how to use it effectively.

Another point raised by the students related to how overreliance on tools like ChatGPT could be actively harmful. If students do not learn how to write on their own, instead taking the ‘shortcut’ of an AI-generated essay, this could be detrimental to them in the long run when they get to university or to a job. They also reported that the use of existing shortcuts, including math-generating tools such as Mathway and Photomath, is already prevalent. Hence, ChatGPT could contribute further to the decline of independent learning. Finally, when students have not learned or analyzed the material on their own, classroom discussions suffer; they will not have developed their own perspectives and ideas to share, leading to a poorer experience for the class as a whole.

A final cluster of perceived disadvantages from the student perspective had to do with worries about misalignments between teacher expectations and results that might be returned by ChatGPT. This took the form of teachers perhaps looking for a particular interpretation of a text or math and science formulas gleaned from online sources that might not correspond to the process that teachers want students to follow.

Both groups shared other concerns and expectations around ChatGPT and the role it—and other large language models—will possibly play in their future lives and careers.

Teachers indicated that they would be looking to industry, academia, and professional societies for guidance on how to use ChatGPT and similar systems, what standards they should implement, and how to craft policies around acceptable and unacceptable use. All three teachers thought that ChatGPT is not, in and of itself, bad or good; rather, it is a technological tool like many others. As tools, chatbots hold promise to enhance education, but at this early point, it is still too soon to know if that promise will be fulfilled or not.

Students also considered ChatGPT to be a tool like any other, with both advantages and disadvantages. Several of the students argued that schools should teach them how to use AI ethically, since it is going to be a part of their lives. Students should understand how to adapt to changes in technology, since technology plays a key role in many aspects of modern society and is not static. In a similar vein, students thought that schools should not just ignore the issue or ban tools outright, but rather should think about how these tools can complement the educational experience. This will be part of the world the students will live and work in and they need to learn how to use these tools well.

Some students thought it was important to note that these algorithms have biases, since they are trained on data available online and generated by humans. Students need to know that generative AI tools could contain these biases as well, and hence need to be cautious of the results they return—that is, not to take them at face value. Other students wanted to know if ChatGPT might feed users false notions and provide justification for inaccurate information if asked certain questions in certain ways.

Though the group represented here is self-selected, we think that a number of important ideas are raised by the discussion. ChatGPT and its competitors are tools, hence not in and of themselves ‘bad’ or ‘good.’ Rather, they have potential to support learning through modeling of certain types of writing, providing prompts for discussion or creative works, and offering additional aid or perspective to students. On the other hand, students and teachers alike are leery of the potential drawbacks to these technologies—diminishing the ability of students to think for themselves, enabling plagiarism, perpetuating biases, and providing false information.

Teachers and students are looking for guidance on how to navigate these technologies successfully, while being aware of the fact that the landscape is definitely not static. As if to prove this point, while we were writing this article in March 2023, OpenAI rolled out a new and improved algorithm: GPT-4. In the ensuing months, as we went through the publication process, the technologies and their uses continued to shift. But no doubt the same issues persist. Students would like schools to help them learn how to use AI algorithms ethically, rather than outright banning technologies that will continue to be part of their educational and professional lives. Teachers, in turn, are looking for help in understanding the benefits and limitations of ChatGPT, GPT-4, and the like. The educational system at the high school level, not just higher education, will have much to grapple with as these technologies continue to evolve.

Afternote: Though not a formal survey, we think that this exercise has highlighted some issues for future consideration. In particular, students realize that these technologies will be part of their learning and working

environments and are looking for the educational system to help them use AI (and machine learning) tools critically and ethically. Likewise, teachers are seeking guidance from industry and academia on how to navigate this new and ever-changing landscape. Collectively, we ask the scholarly community to think about the pedagogical implications of large language models and related technologies, and their potential impacts on the secondary school population (teachers and students alike).

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Disclosure Statement

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Appendix

Discussion Questions:

1. For Teachers

(a) Do you see any educational value in exploring the use of ChatGPT in your field, with students in your classes? Elaborate.

(b) Do you currently have or are you planning to institute a class policy surrounding the use of ChatGPT? Why or why not?

(c) Are you considering incorporating the use of ChatGPT into lesson plans? If so, how?

(d) Do you consider any use of ChatGPT by students in your classes to be cheating? Why or why not?

(e) Other thoughts or questions to discuss?

2. For students:

(a) Do you think that ChatGPT can bring value to your educational experience?

How?

(b) What are some examples of positive/helpful uses of ChatGPT for school?

(c) What are some examples of negative/unhelpful uses of ChatGPT for school?

(d) Do you consider the use of ChatGPT to be cheating? Why or why not?

(e) Other thoughts or questions to discuss?

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Footnotes

1. Chomsky (2023) and Knight (2023) are but two of many examples. ↵
2. See McMurtrie (2023), Surovell (2023), and Chrisinger (2023). ↵