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Artificial Intelligence in Education: Promises and Challenges for Educators

Rapid development in the field of artificial intelligence (AI) is a hot topic, with researchers, the media, business leaders, and others questioning its impact on how we work, communicate, and define knowledge. As AI proliferates at breakneck speed, educators experience a mixture of bewilderment, intrigue, and consternation; while some view AI as an exciting technology that could revolutionize teaching and learning, others see it as a force that may threaten student learning, privacy, and educators' jobs.

Regardless of one's perspective on AI applications in education, most people agree that it has the potential to profoundly impact K-12 education practice in both positive and challenging ways. Certainly, AI tools offer the potential to personalize learning and differentiate instruction, supercharge research and writing, improve student outcomes, and reduce teacher workload. Conversely, it raises concerns about data privacy, bias, cheating and plagiarism, and the role of educators in the learning process. Perhaps more importantly, new AI technology raises important new questions for educators about the nature of teaching and learning, ownership of ideas, and the value of technology usage skills for college and the workforce.

This *In Focus* describes emerging AI technology, examines some potential benefits and challenges to its application in schools, suggests issues of consideration before incorporating the use of AI technology into teaching and learning, and provides sources of additional information.

What is AI Technology and Why Are Some Technologies Generating Debate in Education?

AI technology is any technology that makes machines mimic human-like functions or behaviors through the application of statistics and algorithms. Common functions of AI include speech recognition, language translation, visual perception, and decision-making. AI is referred to as *intelligence* because its programming allows it to *learn* through its own experiences and refine its feedback based on that learning. Some common types of AI include interactive navigation systems, facial recognition software, autocorrect functions, customer service chatbots, and personal assistants like Siri and Alexa. More complex AI software combines multiple human-like functions through multifaceted algorithmic learning.

Perhaps the newest and most disruptive AI technology for K-12 schools is [ChatGPT](#). This free app,¹ launched in November 2022, is a type of AI technology² called a "language machine." It indexes words,

¹ There are now both free and paid access points to ChatGPT. Paid access provides additional accessibility, faster response times, and some new privacy options.

² Although Chat GPT has received a lot of attention in the media and among educators, there are many other apps just like it, and many more that are likely to be forthcoming. The AI landscape is moving very rapidly.

phrases, and sentences to make sense of and respond to human language in a format that resembles instant messaging. Of course, ChatGPT has no real “intelligence” in that it does not know what words mean; however, it uses words to effectively answer questions, write articles, compose essays, create poems, develop song lyrics, engage in debate, summarize information on almost any topic, and more. It can communicate in almost any language, including the ability to code in several computer languages.

Many educators have established free ChatGPT accounts to experiment with its capacity and found that it is virtually indistinguishable from interaction with a human. In fact, essays composed by even early versions of ChatGPT have passed for average, or better, work by a typical high school or college student.³ The most recent version of ChatGPT generates responses to Bar Exam questions that are of significantly higher quality than the average law school graduate.⁴

The Promise of AI in K-12 Education

Many educators employ AI technology like ChatGPT to make their work more efficient and make students’ work both more instructionally engaging and contemporary.⁵ Educators also are finding that using AI can expose students to a tool that is likely to be an indispensable part of workplaces of the future.

Reducing Educators’ Workload. Educators’ work lives are complex and time-consuming. As a result, most educators seek ways to streamline work-related tasks. Rapidly emerging resources from educators around the globe suggest ways that AI tools can improve educators’ work productivity and efficiency. For example, one educator shared the following observations about ways that ChatGPT can make educators’ work more efficient.⁶

- Given grading criteria and a sample student answer from an English exam paper, Chat GPT marked the paper accurately in a matter of seconds.
- ChatGPT composed a lesson plan for a Geography class in less than two minutes after being given content headings and types of questions. The plan included content, multiple-choice questions, group tasks, stretch exercises, and keyword definitions.
- In seconds, ChatGPT created a series of questions reflecting several levels of Bloom’s Taxonomy for a class on photosynthesis.
- ChatGPT created a curriculum overview document for parents and then translated it into Ukrainian for English learners from Ukrainian-speaking households.

Other educators have used ChatGPT for needs such as developing text for grant applications, creating parent and community letters, writing test questions in various assessment formats, and simplifying complex definitions and concepts. ChatGPT also can create word problems and solve math problems or

³ Herman, Daniel. 2022. The End of High School English. *The Atlantic*. December 9. <https://www.theatlantic.com/technology/archive/2022/12/openai-chatgpt-writing-high-school-english-essay/672412/>. Retrieved April 24, 2023.

⁴ Somoye, Funmi Looi. 2023. Can Chat GPT Pass the Bar Exam? *PC Guide*. April 24. <https://www.pcguides.com/apps/chat-gpt-pass-the-bar/>. Retrieved April 24, 2023

⁵ For example, articles such as [PBS News Hour’s “Some educators embrace ChatGPT as a new teaching tool”](#) and [Education Week’s “What Do Teachers Think of ChatGPT? You Might Be Surprised”](#) demonstrate that many educators have a positive view of AI technology and are using it already as a part of their work.

⁶ Fitzpatrick, Dan. 2022. Sit Tight. ChatGPT Is About to Change Everything in Your Classroom. <https://teachergoals.com/chatgpt-in-your-classroom/?v=7516fd43adaa>. Retrieved April 28, 2023.

science equations with an explanation of each step of the solution. It can extract vocabulary from a text that is at a specific grade level.⁷ The list of innovative AI applications to streamline educators' work is large and growing.

Augmenting Instructional Strategies. Advocates suggest that AI technologies such as ChatGPT can be used as an instructional tool for students. ChatGPT, when asked how it can be used as an instructional resource, offered the following suggestions:

1. **Nonfiction and Creative Writing Prompts.** Given a topic, ChatGPT can create writing prompts and suggest supporting details, different perspectives, sources of evidence, and counterarguments for the essay.
2. **Vocabulary Activities.** Given a topic and grade level, ChatGPT can offer lists of key vocabulary and can show students definitions, synonyms, antonyms, and examples of usage in sentences.
3. **Writing Analysis.** Provide students with examples of essays that were generated by ChatGPT and other sources and ask them to study the structure of the responses to determine which response was generated by AI technology.
4. **Translation Activities.** Provide students with a passage in a foreign language and ask them to use ChatGPT to translate it into English and then evaluate the translation. ChatGPT could generate multiple translations of the same text to compare and contrast.
5. **Feedback.** Given a rubric, ChatGPT can provide students with feedback on early drafts of their writing.
6. **Revision Practice.** Ask students to derive a first draft of an essay through ChatGPT. Given specific criteria, students revise the AI-generated document to improve the content.

ChatGPT also may be used to provide language translation support to students and families who do not speak English and may have applications as assistive technology for students with literacy- and writing-specific disabilities.

Reflecting Emerging Workforce Skills. In only the first few months following its release, about half of U.S. companies began using ChatGPT for workplace applications. Among companies that are not yet using it, most report plans to do so. Employers report using ChatGPT to compose customer service inquiries, create social media and marketing content, resolve computer coding errors, compose emails, create cold calling scripts, develop daily schedules, and summarize meetings.⁸

With the rapid proliferation of new technologies in the workplace, use of the technology in K-12 schools may prepare students to enter the workforce with up-to-date skills. In fact, one study from researchers at the University of Pennsylvania found that about 80 percent of the American workforce could have at least one-tenth of their work assignments impacted by the introduction of ChatGPT-like technology. About one in five workers may see at least half of their work assignments impacted, and higher-income jobs are likely

⁷ For example, AJ Juliani's article "[7 Ways Teachers Can Harness the Power of AI for Learning](#)" gives educators seven distinct ways to leverage AI as a powerful tool and Alice Keeler's "[100 Prompts for Teachers to Ask ChatGPT](#)" gives educators 100 specific prompts that can help educators immediately potentially leverage the tool effectively.

⁸ O'Sullivan, Isobel. 2023. Ten Ways Businesses are Using ChatGPT Right Now. Tech.com. March 6. <https://tech.co/news/10-ways-businesses-using-chatgpt>. Retrieved April 30, 2023.

to be more impacted than lower-income ones. As ChatGPT-like technology integrates with other common software, about half of all work tasks are likely to be impacted.⁹

All educators take seriously their obligation to prepare students for college and the workforce. As a result, some educators are including ChatGPT in instruction to prepare students for emerging workforce applications.

Overall, educators are experimenting with new AI technology to find innovative applications for teaching and learning. Early adopters within elementary and secondary schools are driven at least in part by an awareness that engaging students with emerging technology can be an important part of K-12 education.

Challenges to Incorporating AI in Education

Skeptics of AI applications in teaching and learning share concerns about the impact they may have on academic integrity as well as concerns about student privacy. Some educators also wonder if AI will change our concepts of truth and knowledge in negative ways.

Academic Integrity. Many educators express concern that the use of ChatGPT or similar technologies creates new high-tech forms of academic dishonesty. The temptation for students to engage in academic dishonesty is particularly concerning since AI such as ChatGPT can generate coherent and unique essays, poems, stories, and even computer programming code for students. Because the current generation of AI produces a unique written response each time it is asked a question, traditional plagiarism detection software is highly unlikely to discern incidents of text produced by AI.¹⁰ As a result, many educators are concerned that some students will be denied important learning opportunities if they choose to rely inappropriately upon AI-generated content.

In response to the increased possibility of academic dishonesty, educators may employ several strategies to encourage students to produce original work. For example, educators should consider making expectations very clear to students about when work must be original; talking to students about how student work will be monitored for AI misuse; requiring students to properly attribute all AI-generated content; and communicating why learning to write independently is important.¹¹ When asked, Chat GPT recommends the following additional strategies to discourage its use in academically dishonest ways:

1. Teach students how to properly cite sources. Encourage them to take ownership of their work and to value academic integrity.
2. Look for signs of AI-generated content such as inconsistencies in writing style across a student's assignments, repeated writing patterns, or the citation of unusual sources.
3. Keep apprised of developments in AI-detection software that can help discern text that is unlikely to be human-generated.
4. Create unique assignments that require critical thinking and original analysis, synthesis, and evaluation rather than simply summarizing information found online. Assignments that require

⁹ Eloundou, T., Manning, S., Mishkin, P., and Rock, D. 2023. GPTs are GPTs: An Early Look at the Labor Market Impact Potential of Large Language Models. <https://arxiv.org/pdf/2303.10130.pdf>. Retrieved April 30, 2023.

¹⁰ New AI-detection applications exist, but their accuracy remains quite low.

¹¹ Suggestions are from Klein, Alyson. 2023. [ChatGPT Cheating: What to Do When It Happens](https://www.edweek.org/technology/chatgpt-cheating-what-to-do-when-it-happens/2023/02), *Education Week*, February 21. <https://www.edweek.org/technology/chatgpt-cheating-what-to-do-when-it-happens/2023/02>. Retrieved 4/27/2023.

students to apply knowledge in new ways or to create original content are less likely to be composed successfully by AI.

5. Encourage students to communicate when they are struggling with an assignment. Create a classroom culture that values honesty and integrity and makes it clear that you are there to support students' learning.
6. Engage in classroom discussions about ethical issues surrounding AI-generated content and academic integrity. Encourage students to think about the implications of using AI and how they can use AI responsibly and ethically in their academic work.
7. Ensure students are aware that content generated by a program such as ChatGPT can contain material that infringes upon the intellectual property rights of others.

In addition to the precautions listed above, educators should be aware that ChatGPT finds it difficult to respond to writing prompts that are extremely broad, unspecific, personal, or timely. Consequently, AI-proof assignments may include one or more of the following strategies:¹²

- Ask students to write about something deeply personal like a favorite place or an exciting day
- Center a writing assignment around an issue specific to the local community and/or a very recent news event such as a local construction project or school board agenda item.
- Have students show or explain their work, including rough drafts and outlines.
- Assign writing assignments that require the use of multiple, specific, high-quality citations.
- Ask students to give an oral presentation along with submitting written work.
- When appropriate, assign students to handwrite essays in class or use software that only allows students to have one tab open while typing text
- Put project-based learning to work using frameworks such as those from sources like [PBL Works](#) or [Edutopia's PBL Hub](#).
- Run writing prompts through [ChatGPT](#) before assigning them to students to learn if ChatGPT generates high-quality responses.

Finally, ***educators should always follow any applicable district policies related to academic integrity and the use of AI technology. If there are no applicable policies, PSEA members should reach out to the local association so that the local can engage with administration as appropriate.***

The Nature of Knowledge. Some educators express concern that ChatGPT may change our understanding of what constitutes knowledge because people no longer need to *know* facts and concepts that are readily explained by AI. In addition, ChatGPT does not always generate true statements, which means that reliance on ChatGPT can deceive people and create false knowledge. ChatGPT learns from the internet and human input; consequently, the technology derives *truth* from sources that may be biased or inaccurate.

Security and Privacy. Chat GPT stores and uses individual data and information to improve its algorithm and information that is shared with ChatGPT by a user may be shared by the program in other contexts.

¹² Many of these strategies are from Klein, Alyson. 2023. [Outsmart ChatGPT: 8 Tips for Creating Assignments It Can't Do](https://www.edweek.org/technology/outsmart-chatgpt-8-tips-for-creating-assignments-it-cant-do/2023/02). *Education Week*. February 14. <https://www.edweek.org/technology/outsmart-chatgpt-8-tips-for-creating-assignments-it-cant-do/2023/02>. Retrieved April 28, 2023.

Other AI technology varies in the extent to which it ensures user privacy and privacy protections may vary whether a user engages with a free or subscription version of AI.

Children and youth may seek out new technology without a clear understanding of the privacy controls in place to protect user data. Because educators do not know what information is stored in AI applications like ChatGPT, it is not possible to ensure that personally identifiable information is not being stored by the program. These data privacy concerns may lead some schools to block ChatGPT and other AI technologies on their networks and devices. For example, New York City Public Schools, along with districts in Seattle, Baltimore, and Los Angeles, acted within only a couple of months of its release to block ChatGPT from all district devices and networks.¹³ Schools also may determine that it is safest to discourage students from using AI to complete any school-related assignment, regardless of whether the student is working on a school-issued or personal device.

Blocking the use of current technology on school-issued devices is one way to decrease student privacy concerns. It also runs the risk of making schooling less relevant to students and less useful to future employers who may rely on AI technology in the workplace. In addition, it can widen opportunity gaps if some students have access to this technology at home and others do not. Because of the complexities associated with student security, privacy, and equity concerns, ***educators should work with their union leadership and UniServ Representatives to seek clear policies from their employers on the appropriate use of technology in teaching and learning and always closely follow their workplace policies. Educators who use AI systems also should be aware of the terms and conditions for the use of each platform.***

Evolving Status of Regulations and Guidance. Educators who utilize ChatGPT and similar programs should recognize and stay abreast of the evolving guidance and regulation in this area. The legal issues that are implicated include data privacy, copyright infringement, liability, and others. For example, copyright violations could be alleged in relation to the materials used to train the AI or in relation to the product produced by the AI. The U.S. Copyright Office has launched an initiative¹⁴ to examine intellectual property issues associated with AI, and litigation alleging copyright violations and data privacy claims have already been filed in at least two federal courts. In addition, the White House has issued a Blueprint for an AI Bill of Rights¹⁵ which identifies principles that should be used to guide the development of AI systems. Employers are likely to consult with their solicitors on these issues and may put policies in place regarding permissible and non-permissible uses of AI in order to mitigate risks to the organization.

Conclusion

There is no doubt that an AI wave is upon K-12 public schools. This wave is likely to have a massive impact on education as we know it, and it is likely here to stay. There are real concerns and difficulties for educators as they navigate the role this new technology will play in classrooms and conceptualize its role in the broader society. There also are intriguing applications that can make educators' work more efficient and students' skills more contemporary and job-ready. When it comes to new technologies that also raise privacy and academic honesty concerns such as ChatGPT, educators have a particular need to move with

¹³ Claybourne, Cole. 2023. Chat GPT in Classrooms: What to Know. *U.S. News & World Report*. January 18. <https://www.usnews.com/education/best-high-schools/articles/chatgpt-in-classrooms-what-to-know>. Retrieved April 28, 2023

¹⁴ <https://www.copyright.gov/newsnet/2023/1004.html>

¹⁵ [Blueprint for an AI Bill of Rights | OSTP | The White House](#)

care, follow all district policies, and seek clarity from their employer before students are required to engage with the technology or it is downloaded onto school-owned devices.

For More Information

The number of articles and other resources related to AI applications in public schools is large and growing daily. Below are several articles current to the date of this *In Focus*. A timely understanding of the state of AI in K-12 schools requires a search of current resources.

- [Don't Ban ChatGPT in Schools. Teach with It](#), From *The New York Times*
- [ChatGPT: Educational Friend or Foe?](#) From the Brookings Institute
- [With ChatGPT, Teachers Can Plan Lessons, Write Emails, and More. What's the Catch?](#) By Madeline Will in Education Week
- [ChatGPT: Teachers Weigh In on How to Manage the New AI Chatbot](#), By Larry Ferlazzo in Education Week
- [Can I Use This \(AI\) As a Tool for Teaching and Learning?](#) At ditchthattextbook.com
- [The Hitchhiker's Guide to the AI Classroom](#), an online learning video
- [50 ChatGPT Prompts for Teachers](#), From classtechtips.com

For assistance with job-related issues pertaining to local policies and practices and questions about allowable activities, please contact your UniServ Representative.