

The Rise of ChatGPT and Generative A.I. and What it Means for Schools

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Abstract

ChatGPT joins a fast-growing list of generative artificial intelligence services capable of human-like conversation and creating new text, images, videos, code snippets and more from text-based input or prompts. Generative AI shows early promise both inside and beyond classrooms and school systems, but in its current iteration, and based on the data it is trained on, there are significant limitations as well. As with calculators, search engines, and other innovations, educators should be aware of the capability of generative AI, and continue to adapt and refine instructional and administrative practices to keep learning meaningful and authentic.

Key Words

Artificial intelligence, AI, A.I., Generative A.I., GPT-3, GPT-4, Generative Pre-trained Transformer, ChatGPT, OpenAI, Bard, Sparrow, DALL-E, Lensa

Products like ChatGPT and DALL-E are joining a new generation of artificial intelligence-based services that offer life-like dialog, impressively rendered artwork, and a level of overall comprehension not previously attainable by a computer or machine (Montti, 2022). These apps have generated fierce debates inside and beyond education about the ethics of A.I.-generated work, and opposition from people who claim that these apps are essentially a high-tech form of plagiarism. They have also made many (human) professionals understandably nervous about their own futures—why would anyone pay for art, for example, when they could generate it themselves (Roose, 2002)?

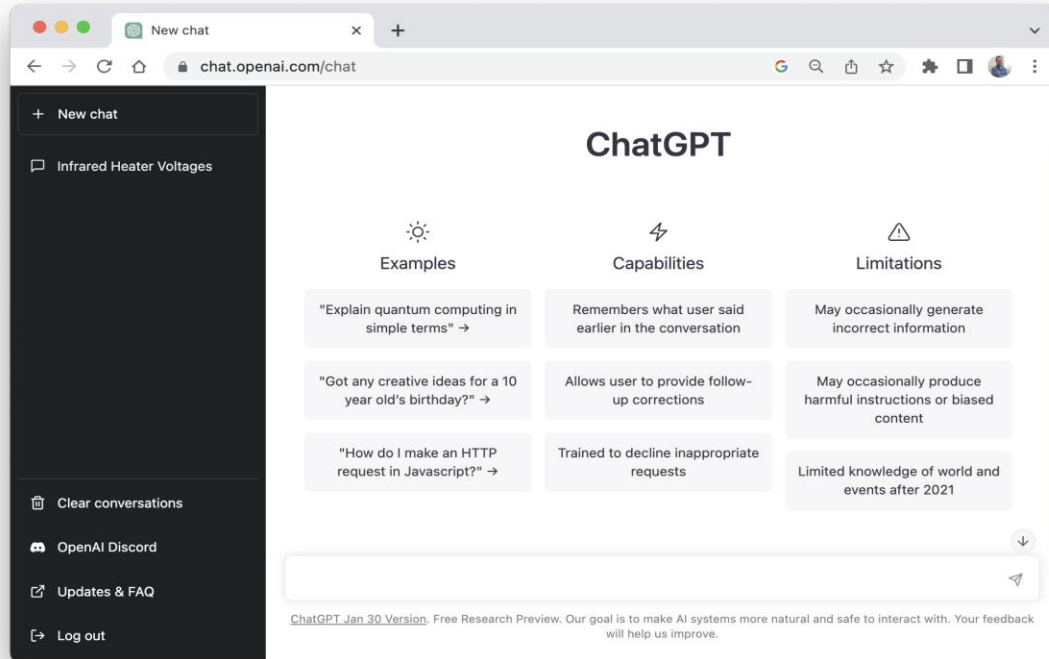
Schools are swiftly deciding how to address this evolving technology too. In December 2023, New York City schools and Los Angeles Unified School District blocked and banned ChatGPT from all district devices and networks (Rosenzweig-Ziff, 2023). Jenna Lyle, a spokeswoman for the New York City Department of Education, said, “while the tool may be able to provide quick and easy answers to questions, it does not build critical-thinking and problem-solving skills, which are essential for academic and lifelong success” (para. 2). Around the same time, Philadelphia schools took a different approach by carefully observing

but not blocking the ChatGPT service, with spokesperson Monique Braxton saying, “we are always looking at how new products are affecting our students” (para. 10).

For background, ChatGPT (Generative Pre-trained Transformer) was developed by OpenAI, and can be considered “part Wikipedia, part researcher, part analyst, and part poet” (Hachman, 2022, para. 2). While voice assistants like Siri, Alexa, and Google excel at reciting information or completing succinct tasks like offering news headlines or converting ounces to cups, ChatGPT utilizes a technology called “generative A.I.”—just like DALL-E, Stable Diffusion, and Lensa AI—which doesn’t just analyze or regurgitate existing data, but creates new text, images, videos, code snippets and more from text-based input or prompts (Roose, 2022).

While its utility may sound profound, visually, ChatGPT is very unassuming at first glance. When the website is launched, the user is presented an empty chat-like interface with some caveats and disclaimers (see Figure 1). Once you submit your first prompt, question, or other directive, ChatGPT will process and respond back to you, akin to participating in a text message conversation or engaging in a live chat, but, of course, without a human recipient on the other end.

Figure 1

ChatGPT Initial Interface

Fitzpatrick (2023) also lauds ChatGPT's ability to reduce and streamline teacher workload, and Dai (2021) similarly notes artificial intelligence technology allows educators to reallocate time towards personalizing instruction, and facilitating meaningful, student-centered activities, discussion, and discourse.

ChatGPT is trained on the third iteration of GPT technology (GPT-3) and can write a short paper on the causes and outcomes of the French Revolution, a sonnet on brushing your teeth regularly, or even a Shakespearean-style comparison between pounds and euros.

ChatGPT is also aware of its prior responses and can answer follow up questions (Hachman, 2022).

While addressing educational research on artificial intelligence, Haseski (2019) summarizes and observes the use of artificial intelligence in education can:

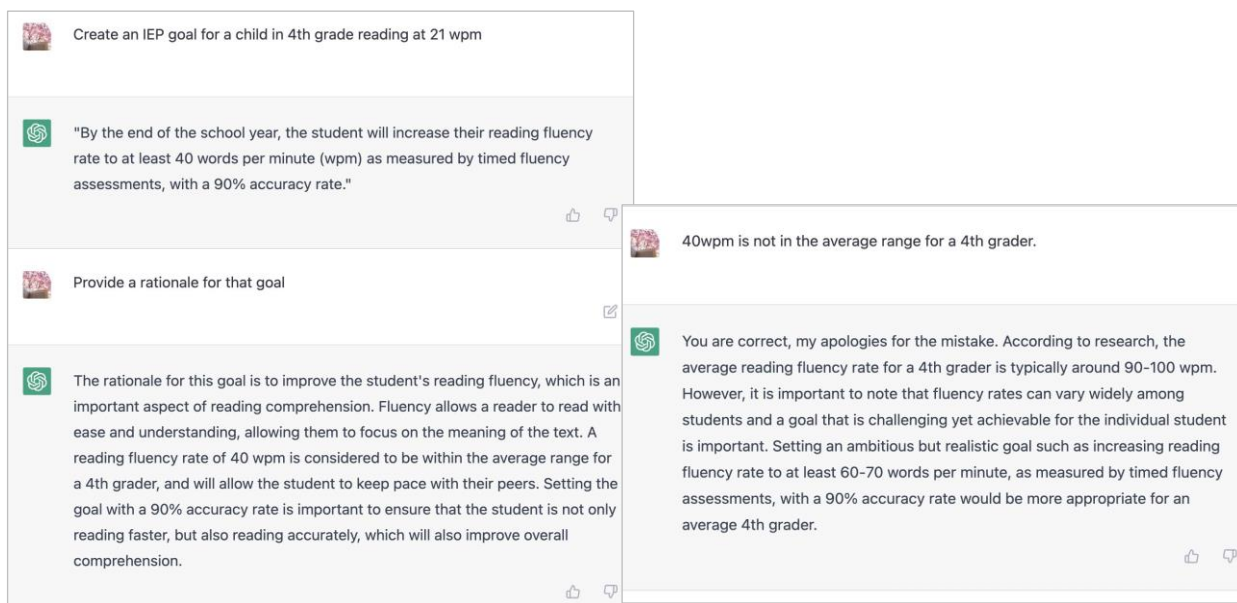
- *make learning more individual,*
- *provide effective learning experiences,*
- *enable students to discover their talents,*
- *improve their creativity, and*
- *reduce teachers' workload.*

Though ChatGPT and other generative A.I. services are in their infancy, educators are quickly leveraging these technologies to create in-class materials for student use. Such uses include writing a nonfiction article with factual errors and challenging students to identify them (Moler, 2023), or creating leveled chapter summaries for differentiated instruction and

producing accompanying multiple-choice questions (Finley, 2023). Generative A.I. has use beyond student-facing classroom activities, drafting project-based learning lesson plans, crafting standards-aligned rubrics, and even writing IEP goals and rationales (see Figure 2) with just a few lines of teacher-provided directive.

Figure 2

Sample ChatGPT-Generated IEP Goal



(Peltier, 2023)

Fitzpatrick (2023) warns the effectiveness of ChatGPT is only as good as the instructions that we provide. He offers the P.R.E.P. acronym, stressing the importance of

providing a clear and specific prompt, referencing context and information, encouraging open-ended responses, and personalizing the conversation:

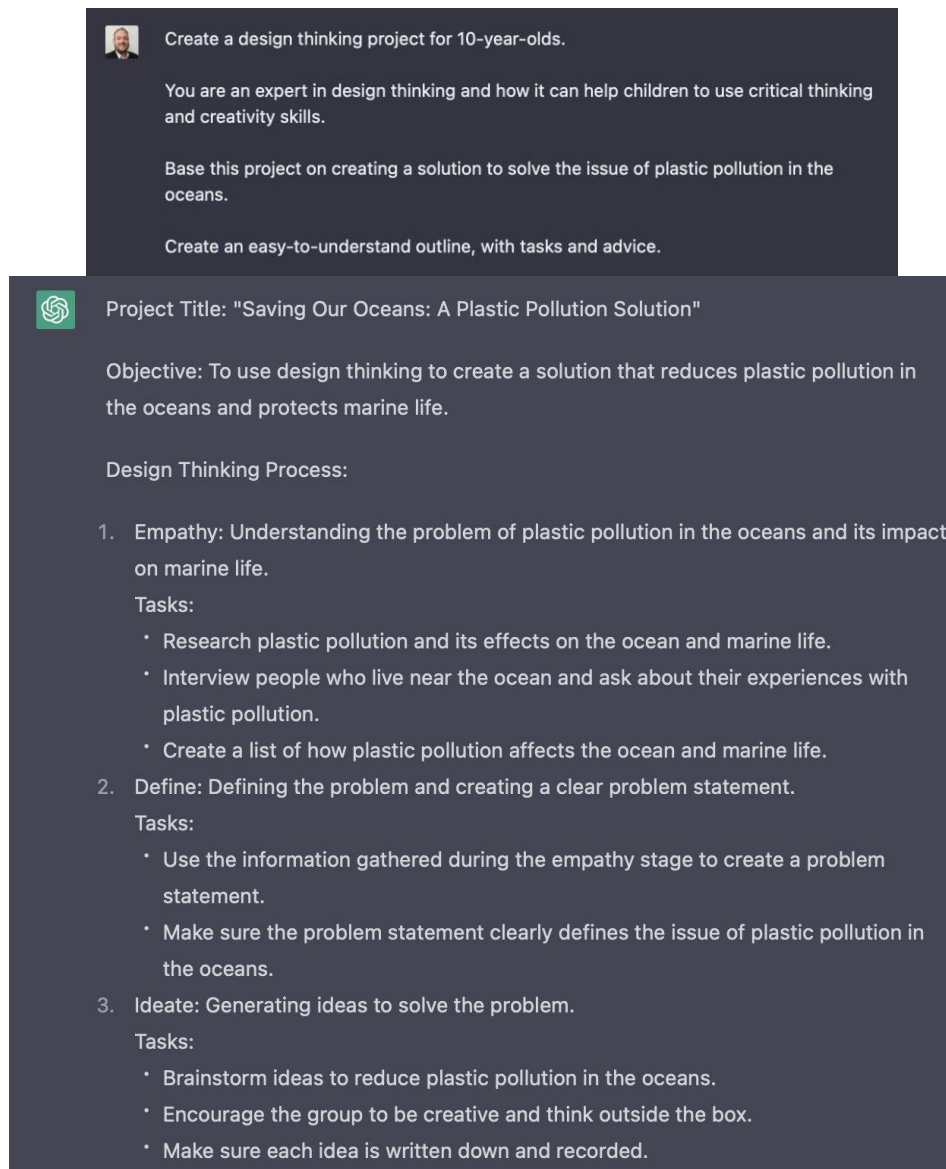
- *You are an expert in population growth and change. Create ...*
- *You are Dylan William, an expert in Assessment for Learning. Coach me on ...*
- *Use clear and simple language, that a 7-year-old student would understand.*
- *Format your answer, using headings, subheadings, and bullet points.*
- *Your answer should be in 300 words, over three paragraphs. Follow the structure of Point, Explanation and Evaluation for each paragraph. (p. 6)*

Using the syntax above, Fitzpatrick (2023) leveraged ChatGPT to quickly generate a fourth-grade design thinking project geared

towards solving a real-world issue. Figure 3 shows the user input and resulting ChatGPT response.

Figure 3

Sample ChatGPT-Generated Classroom Project



The image shows a screenshot of a chat interface. The user's prompt is: "Create a design thinking project for 10-year-olds. You are an expert in design thinking and how it can help children to use critical thinking and creativity skills. Base this project on creating a solution to solve the issue of plastic pollution in the oceans. Create an easy-to-understand outline, with tasks and advice." The AI's response is: "Project Title: 'Saving Our Oceans: A Plastic Pollution Solution' Objective: To use design thinking to create a solution that reduces plastic pollution in the oceans and protects marine life. Design Thinking Process: 1. Empathy: Understanding the problem of plastic pollution in the oceans and its impact on marine life. Tasks: Research plastic pollution and its effects on the ocean and marine life. Interview people who live near the ocean and ask about their experiences with plastic pollution. Create a list of how plastic pollution affects the ocean and marine life. 2. Define: Defining the problem and creating a clear problem statement. Tasks: Use the information gathered during the empathy stage to create a problem statement. Make sure the problem statement clearly defines the issue of plastic pollution in the oceans. 3. Ideate: Generating ideas to solve the problem. Tasks: Brainstorm ideas to reduce plastic pollution in the oceans. Encourage the group to be creative and think outside the box. Make sure each idea is written down and recorded."

Create a design thinking project for 10-year-olds.

You are an expert in design thinking and how it can help children to use critical thinking and creativity skills.

Base this project on creating a solution to solve the issue of plastic pollution in the oceans.

Create an easy-to-understand outline, with tasks and advice.

Project Title: "Saving Our Oceans: A Plastic Pollution Solution"

Objective: To use design thinking to create a solution that reduces plastic pollution in the oceans and protects marine life.

Design Thinking Process:

1. Empathy: Understanding the problem of plastic pollution in the oceans and its impact on marine life.

Tasks:

 - Research plastic pollution and its effects on the ocean and marine life.
 - Interview people who live near the ocean and ask about their experiences with plastic pollution.
 - Create a list of how plastic pollution affects the ocean and marine life.
2. Define: Defining the problem and creating a clear problem statement.

Tasks:

 - Use the information gathered during the empathy stage to create a problem statement.
 - Make sure the problem statement clearly defines the issue of plastic pollution in the oceans.
3. Ideate: Generating ideas to solve the problem.

Tasks:

 - Brainstorm ideas to reduce plastic pollution in the oceans.
 - Encourage the group to be creative and think outside the box.
 - Make sure each idea is written down and recorded.

(Fitzpatrick, 2023)

Even with explicit and detailed input, artificial intelligence is far from perfect. Haggart (2023) cautions ChatGPT's truth is only statistical, and based on web sites (including unvetted, and potentially biased content) and other trained data. Thus, output produced by ChatGPT cannot be verified in the same way that we can trust a reporter or an academic.

And because ChatGPT is trained exclusively in text-based data, there is still a lot missing, since most human knowledge and experience is not language-related or described in text form (Kantrowitz & LeCun, 2023). In offering a tangible example, Kantrowitz and LeCun (2023) ask listeners to hold a piece of standard 8.5" x 11" printer paper horizontally with two hands, pinching each end of the lengthwise paper, and letting go of the paper with one hand.

Anyone repeating this experiment can directly observe the paper droops downward into an almost near vertical position, held only by the other hand, but when Kantrowitz and LeCun (2023) asked ChatGPT to predict the outcome, it generated this response:

If you are holding a piece of paper horizontally with two hands and let go with one hand, the paper will tilt or rotate in the direction of the hand

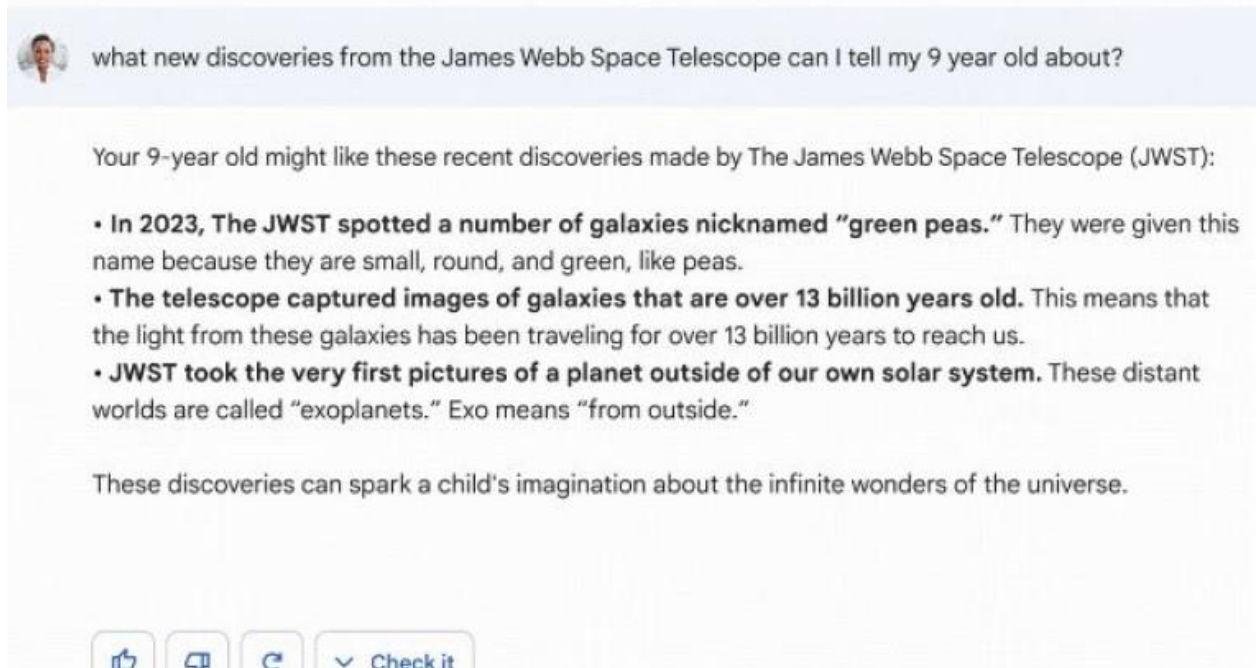
that is no longer it due to the unbalanced forces acting on the paper. If the paper was initially still, it will also move in the direction of the hand that let go due to the force of gravity acting on it.

Though the above may sound correct, be grammatically correct, and the general theme is correct, the response is completely wrong and does not depict the correct and easily repeatable outcome for this experience (Kantrowitz & LeCun, 2023). Occurrences like this serve as a reminder that ChatGPT and other generative A.I. technologies are trained on finite sets of data, and while ChatGPT may be able to swiftly synthesize and interpret existing data, it may not be a good predictor of undocumented experiences or outcomes.

In some cases, the sets of trained data are not always accurate either. When Google was unveiling their own soon-to-be-released version of ChatGPT, named Bard, it made a factual error about the James Webb Space Telescope, falsely claiming "JWST took the very first pictures of a planet outside of our own solar system" (see Figure 4). Scientists were quick to offer the correct response, that the first pictures were taken with the VLT/NACO, which is corroborated in Google's own search engine results (Sparkes, 2023).

Figure 4

Advertisement for Google Bard



(Sparkes, 2023)

Chirag Shah, a University of Washington professor who studies A.I. and chatbots notes, “Companies often put these technologies out too quickly, disregarding their flaws and then trying to fix them on the fly” (Metz & Weise, 2023, para. 25). Through a spokesperson, Google shared, “This highlights the importance of a rigorous testing process ... We’ll combine external feedback with our own internal testing to make sure Bard’s responses meet a high bar for quality, safety and groundedness in real-world information” (Sparkes, 2023, para. 13).

In the classroom there is some concern of students generating responses to assignments or prompts using this same technology, rather than researching and writing them on their own. Lalitha Vasudevan, vice dean for digital

innovation at Teachers College, Columbia University, counters by suggesting A.I. should be embraced as a new learning opportunity. She explains, “if the things that we used to put so much effort into in teaching can be automated, then maybe we should rethink what the actual goals and experiences are that we should work toward in the classroom” (Rosenzweig-Ziff, 2023, paras. 12-13). Miller (2023) offers a similar position, likening ChatGPT to calculators, search engines, Google Translate, and Wikipedia—products that arguably disrupted, but, ultimately, transformed teaching and learning by challenging educators to rethink instruction and student work.

Roll and Wylie (2016) recall a Henry Ford quote, “If I had asked people what they wanted; they would have said faster horses.”

One could argue schools have become “faster classes” that may produce results in a shorter time, but will these fast classes continue in that trajectory? Or does teaching and learning need to be reimagined to make room for generative A.I. while still incorporating the soft skills and critical thinking we expect of our students? If a writing prompt is straightforward enough that a Google search, Wikipedia lookup, or ChatGPT entry can offer a sound response, perhaps the prompt itself can be retooled.

In the classroom, this can be accomplished by making assignments more personal by soliciting students’ experiences and beliefs as part of the work. Specific examples could include prompting students to offer their reaction to a book chapter rather than just summarizing it, applying content knowledge to address or solve a recent real-world situation, or reflecting on a significant life event.

Yunjie (2021) asserts, “The core of educational modernization is human modernization. In the face of the arrival of the era of artificial intelligence, teachers should first change their roles and become the guides, motivators, evaluators and promoters of students’ learning” (p. 5). Similarly, Manyika et al. (2017) assure that good teachers will continue to exist in the future, teaching classes designed to boost students’ “soft skills,” including affective intelligence, creativity, and communication. In fact, according to these

authors, developments in artificial intelligence and automation can actually make people more human.

Technology is evolving fast, and so too, educators must be prepared and ready to evolve as well. In just over two months, ChatGPT reached 100 million active users, making it the fastest growing consumer internet application in history (Paris, 2023). Within mere weeks of ChatGPT’s public launch in December, Microsoft and Google announced their own derivatives. Microsoft is embedding a version of ChatGPT into their Bing.com search engine (Metz & Weise, 2023), and Google is developing their own aforementioned Bard, which is built off the LaMDA (Language Model for Dialogue Applications) platform (Sparkes, 2023).

A few years from now, there will be further evolution in generative A.I. GPT-4 is already under development (Roose 2022) and will likely eclipse the capabilities of the current GPT-3 based products, like ChatGPT. Offering an analogy, Miller (2023) likens ChatGPT to the “MySpace of artificial intelligences” (para. 73) and underscores it will be the least powerful our students will see in their lifetime. For now, ChatGPT can offer plenty of utility inside and beyond our classrooms, as long as teachers and students are aware of its capabilities and its limitations.

Author Biography

Ryan Fisk is a director of technology and a graduate-level professor based on Long Island and the Lower Hudson Valley of New York. Previously, he served as an educational technology specialist consulting with over 50 districts across Nassau County, a former high School Director of Instructional Technology, and prior to that, as a health and PE teacher, department chair. Fisk has co-authored two NYSED-backed publications and led over 120 workshop sessions at the local, state, and regional levels. His recent dissertation research, "Faculty Perceptions of Flipped Professional Development Practices in K-12 Schools" was published in May 2022. E-mail: ryan.fisk@mville.edu

References

- Dai, D. D. (2021). Artificial Intelligence Technology Assisted Music Teaching Design. *Scientific Programming*, 2021, 1–10. <https://doi.org/10.1155/2021/9141339>
- Finley, T. [@finleyt]. (2023, January 30). *NEW!!! How Can Teachers Use ChatGPT to Save Time?* [Tweet; attached image]. Twitter. <https://twitter.com/finleyt/status/1620270764678332416>
- Fitzpatrick, D. (2023). *10 Ways ChatGPT Can Reduce Teacher Workload*. Retrieved January 21, 2023, from <https://thirdbox.org>
- Gocen, A. & Aydemir, F. (2020). Artificial Intelligence in Education and Schools. *Research on Education and Media*, 12(1) 13-21. <https://doi.org/10.2478/rem-2020-0003>
- Hachman, M. (2022 December 5). ChatGPT is the dazzling, scary future of AI chatbots. *PC World*. <https://www.pcworld.com/article/1424575/chatgpt-is-the-future-of-ai-chatbots.html>
- Haggart, B. (2023). Viewpoint: Unlike with academics and reporters, you can't check when ChatGPT's telling the truth. *Phys.org*. <https://phys.org/news/2023-01-viewpoint-academics-chatgpt-truth.html>
- Haseski, H.I. (2019). What do Turkish pre-service teachers think about artificial intelligence? *International Journal of Computer Science Education in Schools*, 3(2), Doi: 10.21585/ijcses.v3i2.55
- Kantrowitz, A. (Host). (2023, January 25). How the bad blood started (No. 150) [Audio podcast episode]. In *Big Technology Podcast*. <https://www.bigtechnology.com>
- Manyika, J., Chui, M., Miremadi, M., Bughin, J., George, K., Willmott, P., & Dewhurst, M. (2017). *A future that works: Automation, employment, and productivity*. Chicago: McKinsey Global Institute.
- Metz, C. & Weise, K. (2023 February 7). A Tech Race Begins as Microsoft Adds A.I. to Its Search Engine. *The New York Times*. <https://www.nytimes.com/2023/02/07/technology/microsoft-ai-chatgpt-bing.html>
- Miller, M. (2023) *ChatGPT, Chatbots and Artificial Intelligence in Education*. Retrieved February 1, 2023, from <https://ditchthattextbook.com/ai>
- Moler, A. [@moler3031]. (2023, January 12). *I asked Chat GPT to write a nonfiction article about the alien and sedition acts with 3 factual errors*. [Tweet]. Twitter. <https://twitter.com/moler3031/status/1613529592777826306>

- Montti, R. (2022 December 26). What is ChatGPT and How Can You Use It? *Search Engine Journal*. <https://www.searchenginejournal.com/what-is-chatgpt>
- Paris, M. (2023, February 3). ChatGPT Hits 100 Million Users, Google Backs AI Bot Maker And CatGPT Goes Viral. *Forbes*. <https://www.forbes.com/sites/martineparis/2023/02/03/chatgpt-hits-100-million-microsoft-unleashes-ai-bots-and-catgpt-goes-viral>
- Peltier, T. [@tiffany_peltier]. (2023, January 13). *OMG--Special Education friends... I just asked #ChatGPT to write an IEP goal and give me a rationale* [Tweet; attached image]. Twitter. https://twitter.com/tiffany_peltier/status/1613998750397042717
- Roll, I. & Wylie, R. (2016). Evolution and revolution in artificial intelligence in education. *International Journal of Artificial Intelligence in Education*, 26(2), pp. 582–599.
- Roose, K. (2022 October 21). A Coming-Out Party for Generative A.I., Silicon Valley’s New Craze. *The New York Times*. <https://www.nytimes.com/2022/10/21/technology/generative-ai.html>
- Roose, K. (2022 September 2). An A.I.-Generated Picture Won an Art Prize. Artists Aren’t Happy. *The New York Times*. <https://www.nytimes.com/2022/09/02/technology/ai-artificial-intelligence-artists.html>
- Rosenzweig-Ziff, D. (2023 January 5). New York City blocks use of the ChatGPT bot in its schools. *The Washington Post*. <https://www.washingtonpost.com/education/2023/01/05/nyc-schools-ban-chatgpt>
- Sparkes, M. (2023 February 8). Google Bard advert shows new AI search tool making a factual error. *New Scientist*. <https://www.newscientist.com/article/2358426-google-bard-advert-shows-new-ai-search-tool-making-a-factual-error>
- Yunjie, J. (2021). Research on the practice of college English classroom teaching based on Internet and artificial intelligence. *Journal of Intelligent & Fuzzy Systems*, 1–10. <https://doi.org/10.3233/jifs-219121>