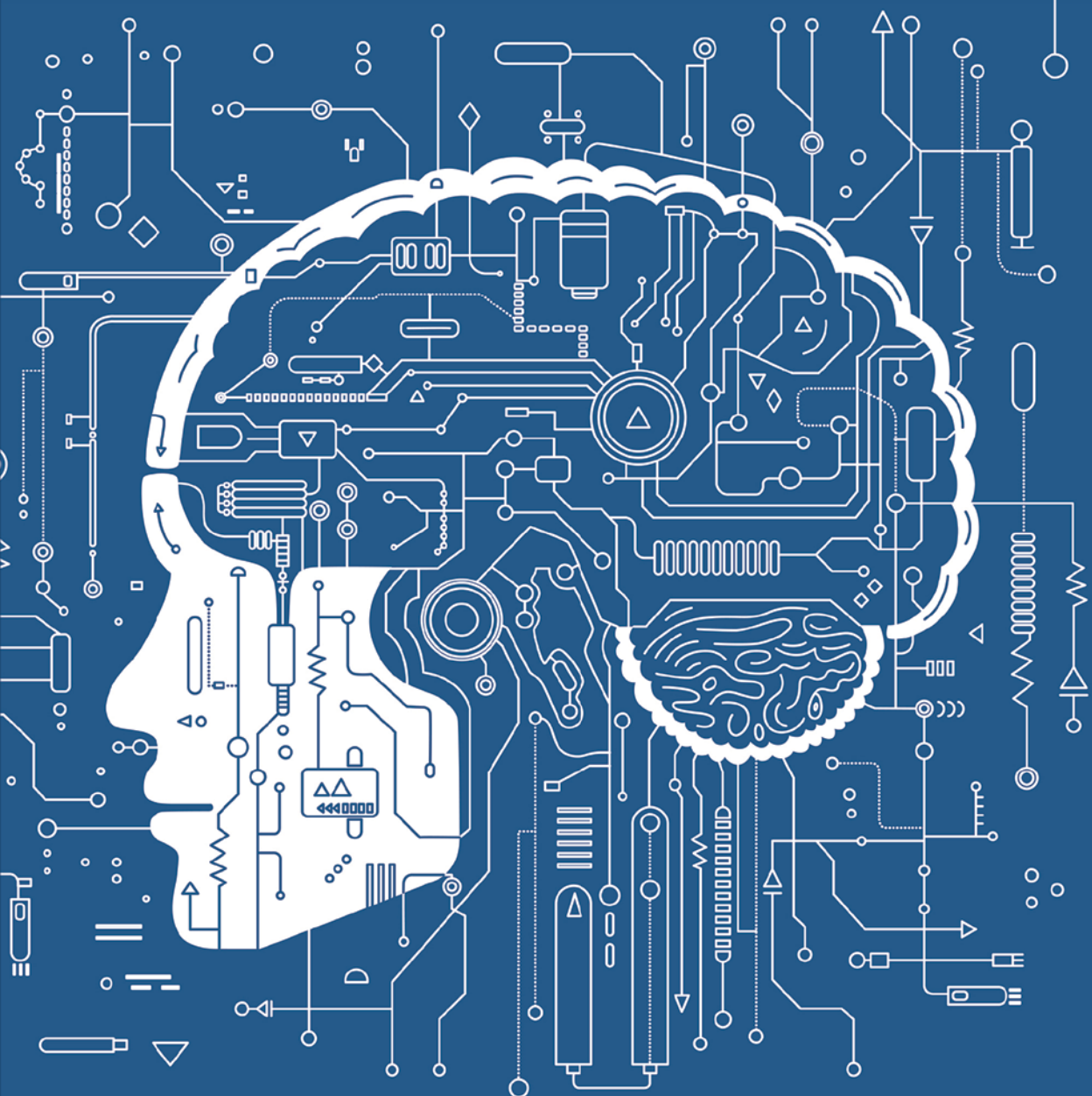


Transformative Technology

TEENS and AI



John Allen

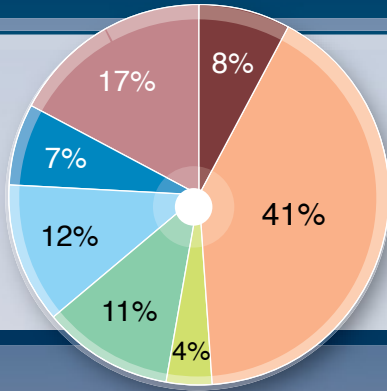
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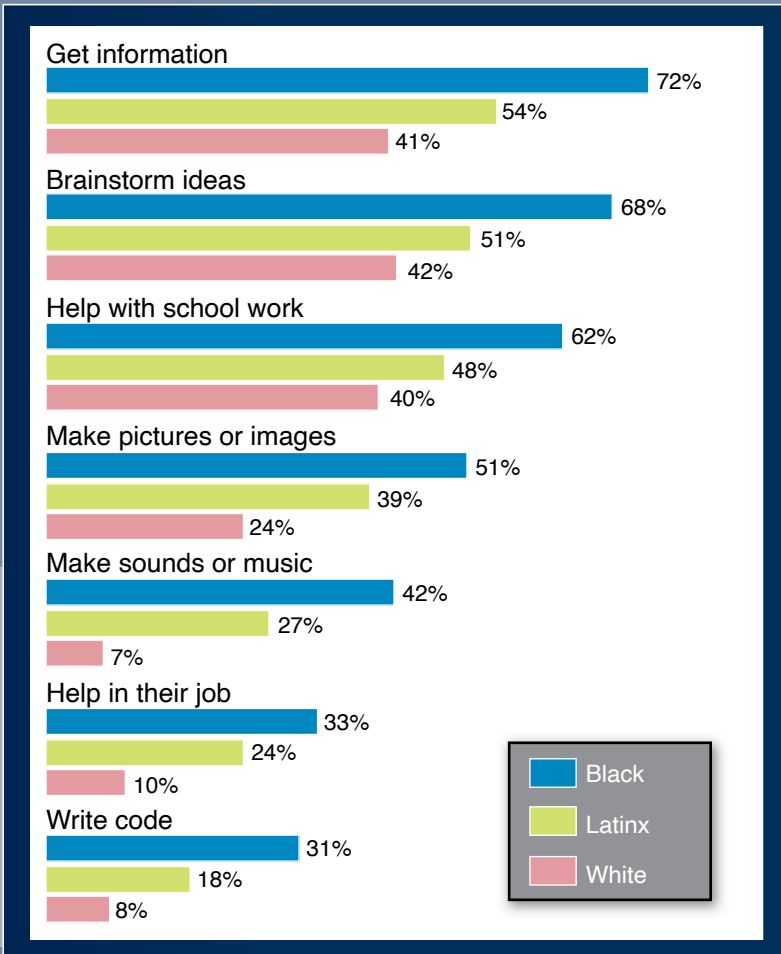
How Teens and Young Adults View AI

How Often Do Teens and Young Adults Use Generative AI?

- Never used AI tools
- Don't know what AI tools are
- Only once or twice ever
- Once or twice per year
- Once or twice per month
- Once or twice per week
- Almost daily or every day



How Do Some Teens and Young Adults Use Generative AI?



Personalizing Education with AI

Since seventh grade, eighteen-year-old Sydney Gill, a high school senior in San Francisco, has entered an annual writing contest sponsored by her school district. In late 2024, however, her last entry was disqualified. She was accused of using ChatGPT or some other chatbot to produce her essay. Ironically, the contest judges had relied on AI-driven software to detect Gill's supposed use of AI. Shocked, and determined to prove her innocence, Gill emailed several companies about their AI detection products. She was told repeatedly that they are very accurate, with false positives occurring only about 2 percent of the time. Gill finally convinced the contest board to let her submit a new essay, but she remains wary of AI and its effects. "I do not think AI is inherently bad, but with AI comes unintended consequences," she says. "We should all consider how dangerous AI tools can be when they are inaccurate, unregulated, and leveraged without full knowledge of how they actually work."⁴

"We should all consider how dangerous AI tools can be when they are inaccurate, unregulated, and leveraged without full knowledge of how they actually work."⁴

—Sydney Gill, a high school senior in San Francisco

When confronted with a similar accusation about using AI, a college sophomore decided to fight back. Leigh Burrell, a computer science major at the University of Houston–Downtown, got a zero on a crucial writing assignment for supposedly using a chatbot. Her paper was flagged as AI generated by a software service company called Turnitin. Fearing the incident could affect her college career, Burrell disputed the claim. She used her computer savvy and Google Docs to create a

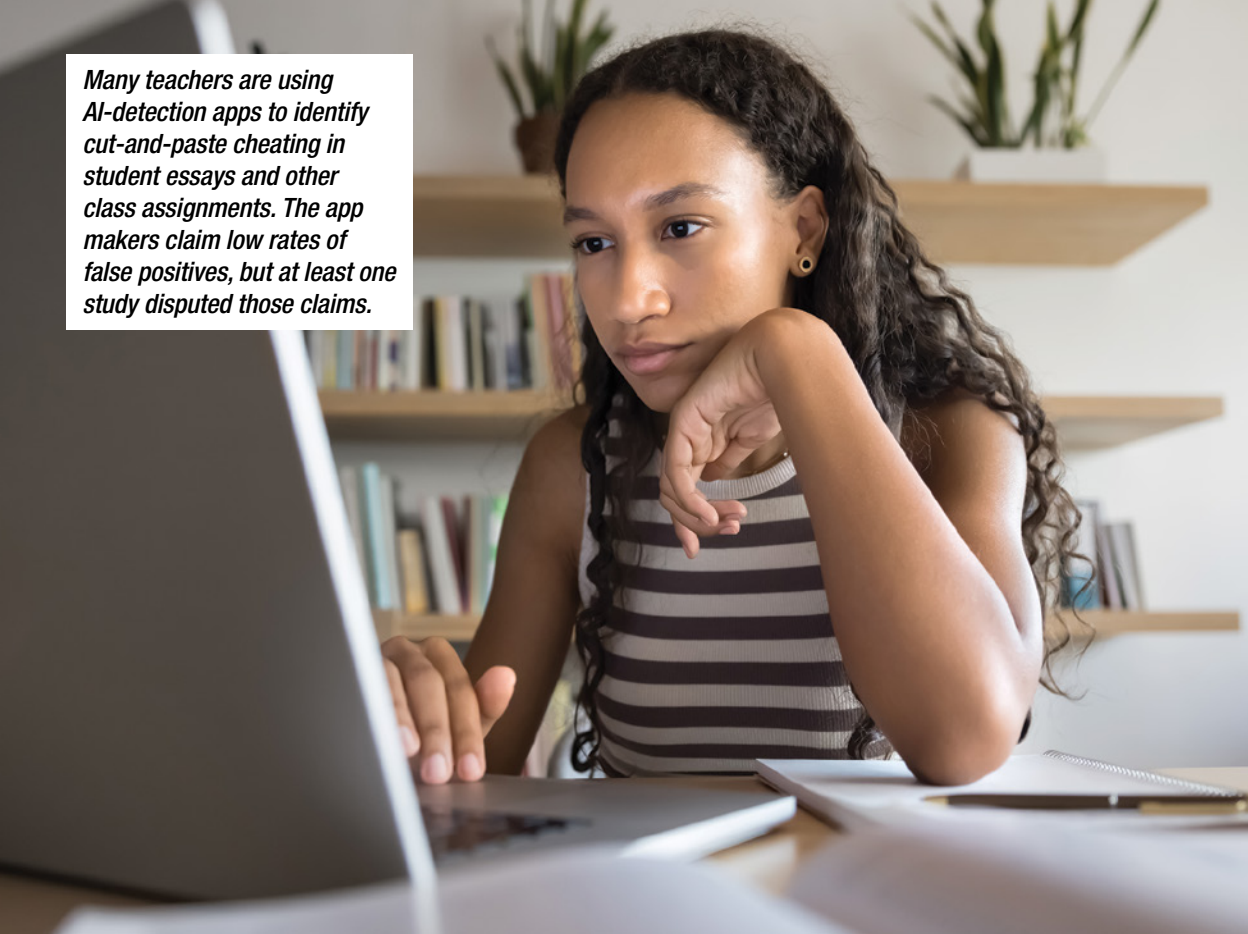
fifteen-page folder of time-stamped screenshots showing her two-day writing process for the assignment. Her teacher examined the evidence and restored her original passing grade. As Burrell admits, “I was so frustrated and paranoid that my grade was going to suffer because of something I didn’t do.”⁵

Concerns About Students Cheating with AI

The emergence of LLM-powered chatbots in recent years as tools for producing text raised concerns among educators. An LLM—or large language model—is the complex program that powers a chatbot. The LLM is trained on huge collections of text—digital books, websites, and articles—to learn patterns in language. When someone asks a question, a chatbot generally does not search the internet. Instead, it uses its LLM to generate a response by predicting which words are most likely to come next based on what it learned during training. College instructors note that AI-produced text usually sounds clear and logical, but it is not always correct, unbiased, or well supported. “The fact that AI-generated content tended to include a lot of fluff, that it frequently lacked precision and direct quotes, and that it often reflected a hesitancy to take strong positions made it all the easier to detect,” says Robert Niebuhr, a professor at Arizona State University, “and made its use less attractive to my students given the severe grade implications.”⁶

Instructors like Niebuhr maintain that these telltale signs allow them to identify obvious cases of cut-and-paste cheating. However, a growing number of teachers are using Turnitin, Grammarly, and other AI-detection apps to flag work that may have been generated by AI and submitted as a student’s own. The software companies claim very low rates of false positives—as low as 2 percent, as Gill discovered. However, an independent study at the University of Maryland disputed those low rates. Researchers looking at a dozen AI-detection services (not including Turnitin) found that text written by humans was misidentified as AI-produced 6.8 percent of the time—three times more often than the usual industry claims. In a 2023 blog post, Annie Chechitelli, Turnitin’s chief product officer, acknowledged the problem. “We

Many teachers are using AI-detection apps to identify cut-and-paste cheating in student essays and other class assignments. The app makers claim low rates of false positives, but at least one study disputed those claims.



cannot mitigate the risk of false positives completely given the nature of A.I. writing and analysis,” wrote Chechitelli, “so, it is important that educators use the A.I. score to start a meaningful and impactful dialogue with their students in such instances.”⁷

Although unreliable AI-detection services have become a source of anxiety for teachers and well-meaning students like Gill and Burrell, these failings do not tell the whole story. Many educators recognize that AI is transforming the ways students gather and process information, while also reshaping the careers their students will eventually enter. For these reasons, teachers are incorporating AI skills into their classrooms and guiding students on how to apply them ethically in their learning. Increasingly, teachers who support AI in the classroom are less worried about students cheating and more focused on ways that they can use this technology creatively. They want students to think of AI as one more tool to improve their education.

Guiding Student Learning with AI Tutors

One way that educators are harnessing AI technology to improve student learning is by adopting an intelligent tutoring system (ITS). An ITS is a computer program that can assess a student's current level of knowledge, style of learning, and preferred working pace, and then personalize the delivery of the curricular content. An ITS also can give feedback on student responses in real time. This helps identify and correct errors or misconceptions rapidly, before they are compounded. As each student interacts with the ITS, the system continues this cycle, evaluating each student's mastery of specific skills before presenting more challenging material. An ITS can even adapt its method of instruction to a student's personal interests, such as sports or music, making the learning more relevant and engaging.

One new ITS product is Khanmigo, an AI tutor and teaching assistant from the nonprofit educational company Khan Academy. Khanmigo was developed with the help of OpenAI, the company that created ChatGPT. Its name derives from the Spanish phrase *con migo*, meaning "with me." It is designed to work closely with students from grades 3 through 12, providing tutoring in areas such as science, math, and writing. It also assists teachers in creating lesson plans. The software is currently being tested as a pilot program in 266 school districts across the United States.

At Hobart High School in Hobart, Indiana, Melissa Higgason uses Khanmigo for various teaching tasks, including lesson planning. For example, she told it to create a four-day course for her ninth- and tenth-grade students to examine the chemical and physical properties of matter. In minutes, Khanmigo produced a detailed lesson plan that likely would have taken Higgason at least a week to create. Her students then can call up the AI tutor on their laptops and begin working on the lesson at their own pace.

Unlike ChatGPT, Khanmigo's main purpose is not to provide answers. Instead, it helps students understand the subject so they can find answers on their own. Its questions are carefully crafted to encourage critical thinking and problem solving. For a lesson on acids in Higgason's class, the software provided three examples—hydrochloric, sulfuric, citric—and then asked the

An AI Tutor Flunks Its Exam

Shortly after the launch of ChatGPT in 2022, Sal Khan, founder of the education nonprofit Khan Academy, announced a bold future for AI in education. “We’re at the cusp of using AI for probably the biggest positive transformation that education has ever seen,” said Khan. This would be accomplished “by giving every student on the planet an artificially intelligent but amazing personal tutor.” Khan certainly has his supporters among educators. But not everyone is impressed with Khan Academy’s new AI tutor for teens. In February 2024 a *Wall Street Journal* reporter tested ChatGPT-powered Khanmigo with some basic math problems. The app often failed to calculate subtraction problems correctly, such as 343 minus 17. It could not consistently calculate square roots or round answers to the correct place. Following the test, a spokesperson for Khan Academy noted that the group was making upgrades to deal with accuracy issues.

AI experts say that large language models have been known to struggle with math. “Asking ChatGPT to do math is sort of like asking a goldfish to ride a bicycle—it’s just not what ChatGPT is for,” says Tom McCoy, a professor at Yale University who studies AI. “We shouldn’t really be surprised that it often makes mistakes.”

Quoted in Matt Barnum, “We Tested an AI Tutor for Kids. It Struggled with Basic Math,” *Wall Street Journal*, February 16, 2024. www.wsj.com.

students to name household items that might contain acid. “And if I wanted to know even more I could ask it . . . what specifically some of the acids do,” says Abigail, one of Higgason’s students.

“It wants to help you understand . . . what it’s telling you and not just . . . give you the information.”⁸ If a student’s response is wrong, it offers hints to help them understand their error. Khanmigo also provides a real-time dashboard that enables a teacher to monitor each student’s progress in detail. The teacher then can spend one-on-one time with students who are having the most difficulty understanding a concept.

“[The AI tutor] wants to help you understand . . . what it’s telling you and not just . . . give you the information.”⁸

—Abigail, a student at Hobart High in Hobart, Indiana

An Ambitious Plan for AI-Driven Education

An even more ambitious plan for AI-driven learning is underway in Austin, Texas. Students at Alpha School, a private institution, rely on AI tutors for delivering their coursework. Instead of teaching, the staff at Alpha mainly provide students with motivational and

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