ARTIFICIAL INTELLIGENCE: HOW STUDENTS ARE ACTUALLY USING GENERATIVE AI

And What Educators Can Do to Adapt

by the HBP editors

Introduction

Few technologies have destabilized higher education like generative AI. Since ChatGPT's debut, educators have been grappling with what these tools mean for them, for their students, and for teaching overall. While some educators have embraced these tools to enhance their teaching, many are left wondering how their students are actually using AI and whether it's helping or hindering their learning.

To help educators better understand how students are experimenting with generative AI tools, we asked them. Some students we talked to are AI evangelists who've committed time and energy to using the technology; others feel more hesitant about it. But all have thought deeply about whether and how generative AI can be used effectively in education.

As you review their answers, consider whether you should adjust your thinking about AI's place in the classroom and how you might guide your own students in using these tools productively.

Q. How do you use generative AI in your day-to-day studies?

Nikola Jurkovic

I use ChatGPT often to help with research, clean up data, answer questions (instead of Google), and help with writer's block. I recently used it to turn a 40-minute raw transcript into a polished script for a final project in one of my courses. I also use DALL-E 3 all the time to generate pictures for presentations.

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Annemarie Rosa

I don't use generative AI for my studies. I don't trust where the information is coming from, so I can't be confident in its outputs. I would only consider using it to create a very bare bones outline for an assignment, and then only if asked to do so by my professor.

Ramya Nambala

I believe the number-one use case for generative AI in the classroom is tutoring. I'm able to create my own GPT with ChatGPT Plus or ChatGPT Pro that's trained on class slides, practice exams, and other materials from my teacher. Because this custom GPT can draw directly from these materials when answering prompts, I use it as a personalized tutor, asking it to explain course concepts or quiz me with practice problems. It's really great because it can be tailored to any class.

Naomi Bashkansky

I use generative AI as a patient tutor, a brainstorming engine, and a coding assistant.

1. Patient tutor. Recently, I was reading AI Regulation Has Its Own Alignment Problem by Guha et al. Policy is a new world to me, and I had many questions about the paper. I could've bothered a friend from Harvard Law School with my questions, but instead I asked GPT-4: "What is cross-selling? Why would it be restricted when it's applied to auditing?" While Google could give me a basic definition of cross-selling, it couldn't deliver a clear answer to the second question. Googling "cross-selling auditing" isn't helpful, either. But GPT-4 easily answered me: "If an auditing firm is also selling other services to an audit client, it could be perceived that the firm might not be as objective or rigorous in its auditing to avoid jeopardizing the sale of these additional services." This explanation helped me better understand the paper.

2. Brainstorming engine. In a class, I had to create a presentation about the lessons a piece of fiction teaches. I asked GPT-4 to generate 10 potential lessons. I liked what the AI provided, and I boiled them down to three to use in my presentation.

3. Coding assistant. For my jobs, research, and classes, I've used GPT-4 and Copilot as a coding assistant. If I don't know how to obtain a certain value or create a graph with certain specifications, I could search documentation for the programs I'm using and hope to find something. But if I ask GPT-4, it will quickly suggest the combination of functions I want, sometimes pointing out useful functions that I had no idea existed. Or if I'm using Copilot integrated into my code editor—VS Code—then I might not even need to switch windows. I simply write a comment in VS Code along the lines of "This function creates a bar graph with logarithmic y-axis" and voila, my wish is Copilot's command.

Anjali Bathra Ravikumar

I use generative AI to teach me how to code and explain difficult technical concepts. To me, the best way to learn to code or develop any hard skill is to practice and make mistakes. ChatGPT is my best friend when it comes to helping me debug error messages or explain issues that come up during my non-linear learning process, which instructors might not have the time for.

When learning about difficult topics—for example, blockchain tech and cryptocurrencies—gen AI is a helpful partner. Once, after reading some literature on the fundamentals of blockchain tech and cryptocurrencies, I asked ChatGPT to explain specific terms and what they meant in context to help me fill in gaps in my understanding. It is especially helpful to ask it "why" and "why not" questions related to any concepts I am trying to learn.

Q. What do you believe are generative AI's greatest strengths and weaknesses in relation to education?

Ravikumar:

Generative AI's greatest strengths are its abilities to answer unlimited questions and give personalized responses. Its greatest weaknesses are the chance that it may hallucinate and give incorrect responses, which interferes with the learning process, as well as its current inability to perform well at creative tasks.

In my experience, ChatGPT gives generic and cliché responses in most creative applications. For example, when my marketing professor recommended using ChatGPT to brainstorm creative solutions to a business problem, I primarily received repetitive, generic solutions from the AI, even after multiple rounds of prompting from different angles. The burden of thinking creatively about the problem still fell on me (the human).

Bashkansky:

Its greatest strength is that it can be a patient and extremely knowledgeable tutor. The most concerning weakness is that it's far too easy to get LLMs to do your homework for you.

Jurkovic:

I find current AI systems to be quite useful for help with programming, as well as dealing with large amounts of data. In terms of weaknesses, one of their current problems is that they often hallucinate, and they can't really work for long periods of time without getting lost or confused. However, I think these weaknesses are temporary engineering problems. The rate of progress is very high, so I expect them to be solved within four years.

Nambala:

The major strengths are, first, that it can speed up your progress by consolidating class information and, second, that it can personalize your learning and meet you where you're at. In a regular classroom, a teacher can rarely give individualized attention to every student. With generative AI, every student has a personal tutor in their pocket. AI's major weakness is that it hallucinates. ChatGPT, for example, is trained on human language, but it's not trained for accuracy. So, sometimes, it'll be inaccurate, and you cannot tell when.

Rosa:

I think the greatest weakness of generative AI is that it is not yet regulated and not yet well understood. There are so many ways that students can use generative AI unethically, including using it to write their assignments for them, and if the AI is

sophisticated enough, the teacher may never know. The strength, on the other hand, is that teachers and students can use generative AI for menial tasks, like proofreading texts, and this allows for more time for creative thinking.

Q. Do you have any apprehensions or concerns about generative AI's place in education?

Jurkovic:

I think that current educational institutions are not fit to meet the rate of change in AI and are lagging in reacting to it appropriately. Using AI effectively will become a crucial skill in the job market, and we're not being prepared for that kind of world.

Nambala:

I do have some apprehensions about generative AI's place in the classroom, but I'm more apprehensive about some of the outright bans of technology I've seen in classrooms. When we ban AI, we're banning a resource that students could use, and we're delaying the inevitable, which is that humans are now going to be using AI consistently.

Also, one of the major problems I'm seeing is that there's a huge gap between students' knowledge and teachers' knowledge of this new technology. So, if students cheat with this technology by using it to write their assignments, teachers may not be aware of what they're doing or the extent to which they may be doing it. I've worked with many high school students through my AI-focused nonprofit Athena EdTech, and these student ambassadors have reported that their peers often misuse AI in this way. However, teachers and administrators are learning to use AI checkers and school regulations to successfully lessen instances of cheating.

Ravikumar:

While I think generative AI should become ubiquitous in supplementing learning methods in education, I am apprehensive about its differential rates of adoption among different demographics and countries, which might affect their overall savviness with this powerful technology. I am also apprehensive about generative AI's tendency to

hallucinate and teach students concepts incorrectly when they are early on in their learning journey.

Rosa:

My biggest apprehension relates to the weakness I stated above: Many teachers lack clear rules on how to use it or an understanding of how to stop unethical use. If students can use it to write their homework without teachers knowing, they're both missing out on learning experiences and potentially plagiarizing. Since generative AI can pull from anywhere, students who use it may end up accidentally using someone else's work without credit. And if teachers can't recognize assignments written with generative AI, they may never know. Furthermore, students and their teachers can't always be certain that research done with generative AI is accurate because, again, AI can pull from anywhere.

Q. What advice would you give to educators and school administrators regarding their approach to generative AI?

Rosa:

One piece of advice is to become knowledgeable in generative AI yourself. If you know the technology, you can better spot when students use it to do their work for them. And you can help students understand the beneficial ways to use it and teach them how to do so effectively.

Bashkansky:

It's not just that AI is here to stay; AI will only get better. There's nothing stopping us from having a cheap LLM developed in the next few years that can pass any Harvard class with an A. Structure your courses accordingly—not by banning generative AI, but by embracing it. Teach courses on prompting. Teach courses on the ethics of AI, on its expected economic impacts, on how to use LLMs in the context of English essays. Become an expert on generative AI—yes, even if your background has nothing to do with computer science. React according to what generative AI will look like in three years, not what it looked like three years ago.

Nambala:

At this point, we can't control that AI is in the world; it's a Pandora's box that we can't take back. The only thing we can do is lean into this change, embrace the upsides and mitigate the downsides. By creating bans that don't allow students to use AI at all, you're simply delaying the inevitable.

Ravikumar:

I would recommend that professors don't shy away from encouraging students to use generative AI in a constructive manner. It is important to drive its adoption among students and set the appropriate guardrails necessary to ensure optimal learning outcomes. Moreover, I have noticed that since the introduction of generative AI, instructors have made their courses, assignments, and exams more focused on testing analytical and critical thinking abilities while applying core concepts, instead of relying on rote knowledge, which I think is a shift for the better.

Finding Generative AI's Place in the Classroom

While every student has a different approach to generative AI, for many, including those featured here, that approach is built around the goal of becoming better learners. Despite some lingering concerns regarding AI's place in higher education, many of these students have high hopes for its potential to enhance education and better prepare students for their futures.

One key theme emerges from all students' answers: generative AI is here to stay. Educators have a responsibility to learn about the technology, experiment with it, and develop a classroom policy built on an informed understanding of how it may shape the future.

About the Contributors

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Safety Team, a student group focused on reducing catastrophic risks from advanced AI.

- Annemarie Rosa is a publishing professional with over eight years of experience in inventory and metadata operations at major publishing houses. She is also pursuing an MS in library and information services at SUNY Buffalo. She holds an MS in publishing from Pace University and a BA in English from Stonehill College.
- Ramya Nambala is the 19-year-old CEO of Athena EdTech, where she's building personalized AI tutors. Recognized in Austin Business Journal as one of Austin's top innovators in Inno Under 25, Nambala is dedicated to actively working toward ensuring the responsible use of AI in classrooms with the nonprofit she founded.
- Naomi Bashkansky is a third-year undergraduate student at Harvard University pursuing a concurrent BA and MS in computer science. She has published papers on AI interpretability and jailbreaking, and she has trained ML models as a research intern at Jane Street. This summer, Bashkansky is interning at the newly formed US AI Safety Institute.
- Anjali Bathra Ravikumar is a recent BBA graduate and international student from the University of Texas at Austin, where she studied business analytics and computer science. She's excited to join Intuit as a rotational product manager and hopes to work on building AI products for small businesses and consumers.