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What's Next After AI Chatbots in Higher Ed?

How Google Cloud AI Is Accelerating Academic Innovation, Scientific Breakthroughs, Campus Operations, and Beyond

In late-2023, a handful of major higher-education institutions announced plans to pilot their own generative AI (GenAI) tools. Since then, developments in GenAI within academia have continued to gain momentum.

Fifty-nine (59) percent of colleges and universities are concerned about "falling behind" in adopting artificial intelligence and has fueled a new ethos across higher education: Plans for the future must include AI in order to adapt to the changing demands of potential students and of the workforce. Institutions are evaluating their strategic plans and exploring how to tap into their data to fuel AI development.

Public perception around the value of a college degree is waning, further escalating the decline in student enrollment. And reduced budgets and staff shortages are forcing many institutions to find ways to deliver quality educational experiences with slimmer operations.

Amidst this environment, colleges and universities are investing efforts to explore where and how AI tools can help them thrive in the next era of higher ed. According to HolonIQ, a global data company that tracks the education market, AI has an expected market size of $6.1 billion in 2025 — with the highest investment growth rate of all advanced technologies within the education sector.

"A university's first-party data is their competitive differentiator. By effectively harnessing that data and combining it with AI, institutions are able to lower costs and increase efficiency."

Roy Daiany
Industry Director for Education and Careers
Google

Generative AI in Higher Ed Today

Understanding How Generative AI Is Helping Higher Ed-Institutions and EdTech Companies Innovate

For many colleges and universities, the strongest use case for AI is within the classroom, where institutional data informs faculty on how to create personalized learning pathways for every student.

"Use cases like personalized learning plans, where AI is able to recommend in real-time or in a dynamic way what the student should be doing next," explained Lukman Ramsey, head of AI solutions for Google Public Sector. "That's something that we've been working on: What is the pathway that is personalized to each student that will get them to their goal?"

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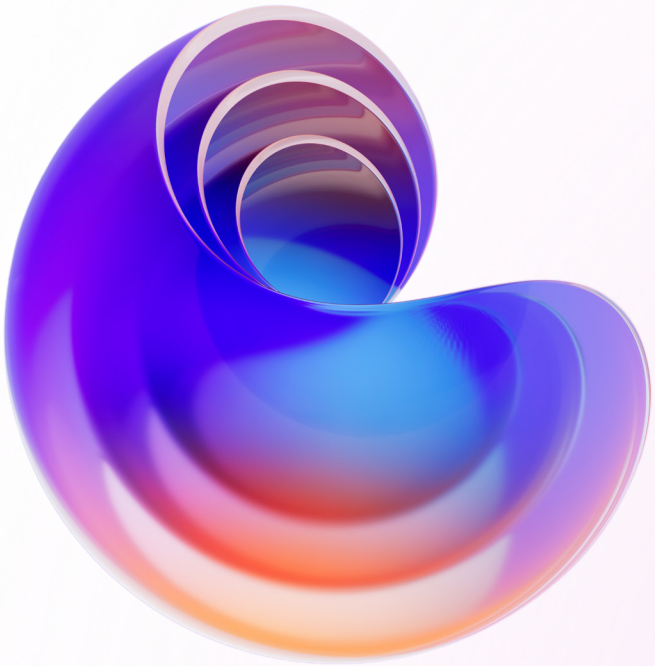
Generative AI in Higher Ed Today

From deepening personalization and improving productivity to expanding access and enhancing research, learning institutions and ed-tech companies are stretching the imagination when it comes to artificial intelligence.

"AI agents are increasingly being built on Gemini to process information faster and perform tasks, expanding the possibilities for what higher-ed institutions can do with generative AI," said Charles Elliott, Field CTO for Research and Education at Google Public Sector.

Gemini 1.5, Google's next-generation model, delivers a breakthrough in long-context understanding — up to two million tokens — across modalities, including text, code, images, audio, and video. Leaning on Gemini's expanded functionalities, higher-ed institutions can explore novel use cases across teaching, learning, and research.



Enabling Personalized Learning Experiences for Students

IBL Education's GenAI-powered tutor, AI Mentor, allows instructors to create virtual mentors for their students that offer personalized learning experiences, assess real-time academic progress, provide on-demand performance feedback and study tips, and give robust learning analytics.

Read more about how IBL Education supercharged their AI Mentor.

IDLA's Clarity platform centralizes data sources and integrates with AI to open new pathways for student, teacher, and parent communications. The platform boosted student pass rates and final grades by more than two percent while giving teachers data-driven insights and efficient workflows to better address individual student needs. Parents gain increased transparency and communication channels, fostering active involvement in their child's education, while AI-powered features like translation ensure information is accessible in multiple languages.

Read more on how AI is empowering teachers at IDLA.

Accelerating Research for Deeper Insights

UC DAVIS HEALTH

U.C. Davis Health is addressing social determinants of health (SDOH) with a GenAI toolkit that uses a database of standards related to SDOH. They are able to create tools to improve electronic medical records (EMR) documentation, and use GenAI to make predictions on best patient treatment plans and outcomes.

Read more about AI is helping UC Davis Health solve health challenges.

UNIVERSITY OF TORONTO

Social scientists at the University of Toronto leaned on advanced AI and natural language processing (NLP) functions to efficiently analyze larger datasets than previously able. The capabilities opened up new options for conducting research previously unavailable to social scientists, who often must heavily rely on human participants to participate in lab experiments or labor through manually-coded data for analysis.

Read more about how AI and NLP are supporting researchers at the University of Toronto.

UCLA David Geffen School of Medicine

Researchers from the UCLA Geffen School of Medicine and the Stanford School of Medicine used AI capabilities to securely analyze patient data to provide insights for clinical practice. At Geffen, researchers are training AI models with CT and PT scans to help improve cancer diagnoses for doctors. At Stanford, researchers are using NLP to analyze patient communications and trying to find ways to use this to improve screening and provide for at-risk populations.

Read more about how AI is used by researchers at UCLA Geffen and Stanford School of Medicine to unlock medical insights.

Innovating to Support Education Accessibility

BRAINLY

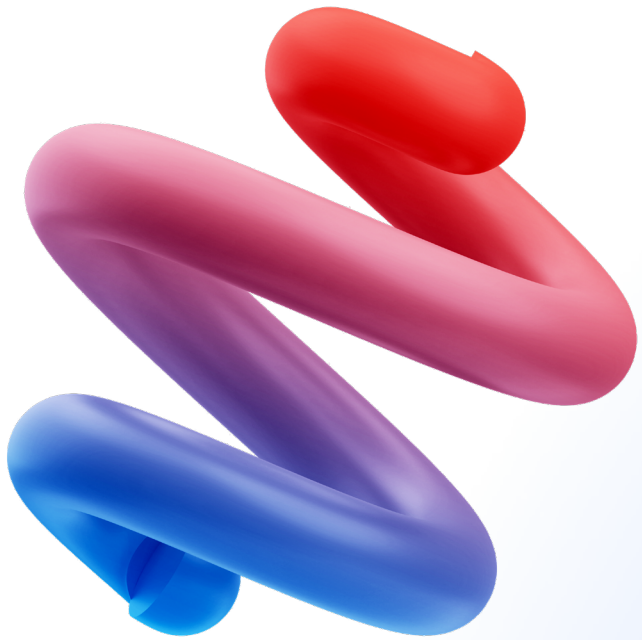
Brainly offers an AI tutor that's personalized to each student. They built a "Snap to Solve" feature that allows students to find answers by taking a picture of a written question, including math problems. Brainly is able to offer students responses to their queries, in their native language.

Read more about how Brainly democratizes student academic support with AI translation.

jobspeaker

Jobspeaker tapped into GenAI to uplevel its curriculum-to-skills mapping capabilities, enabling them to process more curricula and academic programming data. They can do more complex skills mapping, such as making connections between which courses at a specific college can lead to better success towards a specific career.

Read more about how Jobspeaker uses AI to tackle the career skills gap problem.



Increasing Operational Efficiency

Nanyang Technological University in Singapore onboards its 6,000 freshmen students with a virtual assistant chatbot, called "Ask Lyon". The chatbot then expanded to provide support for NTU's 30,000 students, giving them the opportunity to ask queries from student orientation to class registration and financial aid.

Read more about how AI helps NTU save more than 300 hours handling student queries.

Collegis Education tapped into AI to help colleges and universities gain a fuller data picture of what areas of their operations can be further streamlined and where cost efficiencies exist.

Read more about what Cloud tools are helping to inform Collegis' partner institutions.

Jenzabar used advanced AI tools to use their institutional data to optimize areas of core campus operations and to improve strategies for student success.

Read more about how Jenzabar uses AI to help colleges and universities improve efficiency.

AI's Role in Transforming Higher Ed for the Future

Preparing Colleges and Universities for What's Possible With Artificial Intelligence

For now, many higher-education institutions are focused on building out GenAI chatbots to tackle some aspect of the college experience, whether that's giving students informed responses to queries or offering digital support for lean administrative teams. But Gemini and other multimodal models are rapidly evolving, expanding the possibilities to tackle bigger and more complex problems that colleges and universities face.

Advancing Academic Success and Innovation

Intelligent AI capabilities enable the creation of individualized academic pathways. By analyzing institutional data, AI agents can identify students' strengths and learning preferences, tailoring course recommendations and instructor pairings to suit individual needs.

"Gemini 1.5 Pro can process roughly the equivalent of a textbook or hour-long videos, and deliver amazing results in under 90 seconds," said Elliott.

Additionally, AI holds significant potential for enhancing the learning process through the use of text, code, images, audio, and video.

These additional modalities create new opportunities for educating students with different accessibility challenges."

Chris Hein

Director of Customer Engineering for Public Sector
Google

Advancing Academic Success and Innovation

We'll see a shift in higher ed where institutions will move beyond creating a simple chatbot that feeds students with responses to queries, according to Elliott. For example, he said that an institution can create a chatbot that gathers and submits a student's financial aid documentation and then connects them to a financial aid representative when they're ready. As the models evolve, so do the adaptable and practical AI use cases.

Significant advancements in multimodal models, like Gemini, can help create more adaptable tools that allow students to interact with course material that's grounded and without hallucinations — giving them the ability to "converse" with the class period. A student could potentially return to any point in a recorded video of a class and ask questions directly. AI agents can process the information in the video, as well as information from the class syllabus and textbook, and return feedback to the student accordingly.

Advancing Academic Success and Innovation

Research is the top area where advanced AI in large multimodal models can leave the strongest impact in higher education. Elliott says that Gemini's large context window is enabling a lot of that:

"I can now plug in huge amounts of research information into the prompt that I wasn't capable of doing before. Now, I have the opportunity to compare it to research that's been done previously and to easily determine what I can do differently to improve on that past work. And it makes it simpler for me to understand how to position my grant application for successful funding."

Charles Elliot
Field CTO for Research and Education
Google Public Sector

Ensuring Value for Tomorrow's Students

For most higher-ed institutions, there's the pressing issue of attracting more students to enroll — and doing that by trying to meet the changing needs of the workforce. The sentiment for many graduating high-school seniors (and their parents), today, is that the price tag of a college degree is only worth it if an institution can offer the right set of academic and career development programs that can set them up for success post-college.

There's been some early successes in this regard, where a greater contextualization of curricula is informing AI models and guiding higher-ed institutions on how to better align their academic offerings with what employers are looking for from graduates. "In many cases, this is going to be a combination of Google technologies and colleges," said Lukman Ramsey. "These AI models are going to need to be trained on your specific curricula so that we can deliver the best answers." At the University of Waterloo in Canada, for example, AI tools are providing students real-time recommendations for exploring different careers, identifying core skills, and connecting them with the courses that align with those career objectives.

Within the higher-education landscape lies a lot of potential for innovation, especially as AI models like Gemini become more capable:

"Now is a time where a lot of the things that we dreamed of being able to do or we were kind of trying to do, with some limited success, are now much more possible," concluded Ramsey. "AI adds some capabilities that will hopefully make those alternatives more viable and, maybe, more compelling."

Not sure where to start with generative AI?

Accelerate your institution's AI journey with our 10-step plan. Generate personalized content across text, video, images, and code, gain valuable insights from student data, and achieve measurable ROI — all with the enterprise-grade security and scalability of Google Cloud.

Discover 5 generative AI Use Cases in Education

Download our 10-step, 30-day Public Sector Generative AI Guide to kickstart your first generative AI use case.

Watch these on-demand sessions from Google Cloud Next '24 to jumpstart your Responsible AI journey:

A guide for enterprises: How to implement generative AI applications

AI: From proof of concept to impact

Accelerate app modernization with generative AI: A McKinsey perspective

Accelerate software delivery with Gemini and Code Transformations

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