

ASU professor's project helps students learn complex topics

Yidan Prize winner Micki Chi leads center that promotes interactive classroom engagement

By Mary Beth Faller, ASU News
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One of Arizona State University's top professors is using her signature research project to improve how college students learn science, technology, engineering, math and medicine.

Micki Chi, who is a Regents Professor in the [Mary Lou Fulton College for Teaching and Learning Innovation](#), is a cognitive and learning science researcher who studies how students learn complex concepts.

Chi, who leads the [ICAP Center for Teaching and Learning at ASU](#), described how her team is helping to promote interactive classroom engagement — a potent style of student-centered teaching. She spoke on Thursday at the 2025 Yidan Prize Conference, which the Mary Lou Fulton College for Teaching and Learning co-hosted following her win of the prestigious Yidan Prize for Education Research in 2023.

The [Yidan Prize](#) was founded by the philanthropist Charles Chen Yidan in 2016, and the annual awards go to individuals and teams for significant research and practice that expands access to learning. Chi won \$3.8 million to help scale her work.

Chi developed the ICAP Framework, a way to deeply engage students in learning. ICAP stands for Interactive, Constructive, Active and Passive, which describes the four kinds of engagement that professors can use.

"The needs are so great because there's a 48% attrition rate from STEM majors to non-STEM majors. And once you drop out of STEM, you never re-enter STEM again," she said.

"So that's a very serious problem."

Chi described how the interactive and constructive modes of learning are far more effective than active and especially passive, which would include merely lecturing in front of a classroom.

“For the constructive mode and beyond, you actually get deeper understanding. This is obviously really critical for learning STEM concepts because you want to get deeper understanding,” she said.

Interactive work is often group work for college students, and to counteract the inherent flaws, such as one person dominating the group, students can be trained in how to do good group work. The ICAP team has developed a 15-minute training script for that.

“Ultimately our goal is to develop a standalone AI ICAP tutor,” Chi said.

The two-day conference, held on the Tempe campus, featured several speakers and panel discussions, as well as a showcase of the ICAP team’s work — including a demonstration of the ChatGPT tutor.

Sameena Hossain, a postdoctoral research scholar, showed how she is researching ASU students in the Biology 181 courses that include the virtual-reality Dreamscape Learn technology to see how deeply they learn the concepts.

[Carole Basile](#), dean of the Mary Lou Fulton College for Teaching and Learning Innovation, told the conference crowd that educators’ commitment to learning must not be limited to the classroom.

“It is all about how we help humans to flourish, to live better lives, to be social and economically mobile. That is the point of what we’re doing,” she said.

She said that when she became the dean almost 15 years ago, she told people, “We are not going to be about projects, programs and activities that come and go. We have to think about the structures and the systems of our education system because things have to change.”

The conference was titled “[Meeting the Future of Teaching and Learning](#),” and Chen told the crowd that the potential for AI in education is immense.

“AI is reshaping the future in profound ways and education’s core mission is to equip the next generation for the future,” he said.

“Clearly AI presents a unique opportunity to realize long-held aspirations for personalized learning, true education quality and acts as a lifelong learning companion.”

[Andrew Maynard](#), professor of advanced technology transitions in the School for the Future of Innovation in Society and founder of the ASU Future of Being Human initiative, also discussed the challenges and opportunities of AI.

“That challenge is this question of how do we center what it means to be human in learning and education in a future where technologies can emulate much of what makes us us?” he said.

“And I put this up because I don't think we can bury our heads in the sand here. We are going to have technologies that can emulate many of those things that we think are unique to us.”

This story originally appeared on [ASU News](#).

Main image



ASU Regents Professor Micki Chi discusses her work in adopting learner-centered practices at the 2025 Yidan Prize Conference on Thursday, March 27, at the Memorial Union on the Tempe campus. Photo by Charlie Leight/ASU News