

Bridging the 'Math Gap'

Professors across Cal State East Bay come together to continue key program for students

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NOVEMBER 8, 2021

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In forcing schools to close and move to online models, the COVID-19 pandemic disrupted education for all ages and grades. Now, with students back in classrooms, many educators are breathing a sigh of relief at the prospect of returning to “normal.”

However, schools are also now assessing to what extent students fell behind during the 2020 pandemic year and taking action to help students relearn skill sets that suffered as a consequence of instruction being confined to the screen.

Math is a particular focus at Cal State East Bay, where nearly 50 percent of the

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university’s almost 15,000 undergraduates identify as Black, indigenous and people of color (BIPOC). These students are frequently underrepresented in STEM fields, which offer some of the highest paying jobs of the future.

Cal State East Bay has long been committed to promoting diversity and access for minorities in these fields.

“Every department in the College of Science has developed an equity plan,” Department of Mathematics Chair Julie Glass explained. “And the math department is focused on the STEM pathway, which is where those equity gaps have the greatest impact on the future of technology.”

Glass notes that Cal State East Bay has been working for years to “not perpetuate the inequities with which students arrive on our campus. We try to make sure that every student sees themselves as a math learner.”

As educational institutions around the country are being challenged to quantify different types of learning gaps, including those that are not measured by test scores, Cal State East Bay is taking a holistic approach to address what could be called a “math gap,” but professors believe is actually something more.

“For students of color and our female students who traditionally aren’t perceived to perform as well in areas like math, I don’t think it’s really the content itself,” Director of General Education and Professor of Biology Caron Inouye said. “It’s much deeper than that. It’s not necessarily gaps in knowledge, but rather gaps in confidence and social and emotional support. It’s really that social and emotional piece that’s so important.”

A LEGACY OF SUCCESS

Housed in the College of Science, the Math Lab has a legacy as a vibrant hub, a visible spot on campus where socializing and learning go hand in hand. Prior to COVID-19,

students could sit with Learning Assistants, or LAs — other students assigned to every entry-level math and statistics course — who could see them puzzle out problems with pencil and paper and identify their mathematical stumbling blocks.

“Before the pandemic, this place was packed,” coordinator of the Math Lab Alicia Still said. “We were pulling chairs from wherever we could.”

The forthcoming Applied Sciences Center designs address space needs with a flexible design that will accommodate the Math Lab’s collaborative model.

Undergraduate Tenaja Jefferson is living proof of the benefits of that environment — and of how factors beyond hard skill sets pose real obstacles for Cal State East Bay students.

Jefferson thought she was done with math when she went to college, especially after completing her one required class. “I didn’t think I was smart enough to do it,” she admitted. “You can do it, you can do it,” Jefferson recalled Professor Ange Zhou saying, which helped inspire her to join the Math Lab as a staff member and pay that positive reinforcement forward.

END-TO-END SUPPORT



Socializing and learning go hand-in-hand at Cal State East Bay’s Math Lab.

From initiatives aimed at helping K-12 Bay Area schools, whose students comprise a majority of Cal State East Bay’s student demographic, to tailored programs like the robust on-campus Math Lab that offers one-on-one instruction, the university is working from multiple angles to ensure student success.

In addition to the Math Lab’s LAs, graduate students are also involved in helping younger Pioneers see themselves as future STEM teachers and professionals, while also getting invaluable hands-on experience for their own career development.

Professor Simone Sisneros-Thiry helps train the graduate students who serve as teaching associates (TAs) and provide direct instruction in math classes. Sisneros-Thiry co-facilitates a “Community of Practice” in which the TAs and other math

instructors learn from each other. “We improve our practice and talk about what we’ve tried and what we want to try,” Sisneros-Thiry said.

Some of the topics the graduate students discuss in their training include active learning strategies, assessments, pacing and alignment of materials, and specific areas of struggle. In a spirit of cross-pollination, Sisneros-Thiry then brings what she hears to the Math Lab, both to share ideas and to hear what’s happening there, so everyone knows “what students need, and what’s working and what’s challenging,” across all facets of in-class instruction and the Math Lab program.

“We want to make sure that we’re supporting them with interesting, challenging problems and coordination across the sections so that the students are getting a cohesive experience,” Sisneros-Thiry said.

It’s these types of wraparound services for which the National Institute for Learning Outcomes Assessment recognized Cal State East Bay with a 2021 Excellence in Assessment designation. The university was one of only seven schools in the country so honored this year.

“We work to really get them through [their classes] with knowledge of the mathematics that they need — and the competence and identity and community they’ll need to succeed as scientists and mathematicians,” Glass said. “In any area of science, that collaboration and confidence is the key to moving forward.”

AN EVEN BRIGHTER FUTURE

The Math Lab is now back up and running, and remains a linchpin in the effort to strengthen students’ mathematical abilities. The capacity to reconnect in person, according to educators, represents a pivotal piece of what academic recovery from the pandemic really means.

For her part, Glass said she and her colleagues lobbied hard to bring back face-to-face classes — “especially freshmen, especially in mathematics.”

At the same time, multiple professors, including Associate Dean in the College of Science Danike LeDuc, are working to upgrade how the Math Lab operates, which includes integrating some of the benefits of online learning.

“When COVID hit in early 2020, the Math Lab switched to an online model and instruction proved less effective,” LeDuc said. Over Zoom, LAs might be working on different versions of a software program than a student, leading to confusion and frustration. Nonetheless, some students were relieved not to have to drive to campus in Bay Area traffic. Others used that extra time to focus even more on their studies.


“Mathematics often feels very isolating for people. Making that learning public is important.”

— Julie Glass

It's why the Math Lab has upgraded to a hybrid tutoring model, with assistance available both in-person and online — and the university plans for even more visibility for the program going forward.

Coordinator Alicia Still explained that the Math Lab is slated to become the STEM Lab in the near future and have a sparkling new home in the Applied Sciences Center that Cal State East Bay is currently raising money to build.

“We'll have so much more space, it will be fantastic,” Still said. “We brand ourselves as a community learning space. Not only can you get help, but you can study and be with each other here.”

“Mathematics often feels very isolating for people,” Glass said. “Making that learning public is important.” 

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