

Third Annual City Academy Math Symposium

by Roger Quiñonez and José Francisco Gutiérrez

The third annual City Academy Math Symposium, organized by the College of Education and City Academy, a secondary charter school in the heart of Salt Lake City, continues to showcase how mathematical inquiry and analysis can strengthen students' identities, as well as their connections to their communities. This year, over 120 attendees strolled the Sorenson Arts and Education Complex as 50 middle and high school students presented on topics that mattered to them most—all filtered through the lens of mathematics—making 2024's symposium the biggest one yet.

Lead symposium organizers include José Francisco Gutiérrez, Ph.D., assistant professor of Education, Culture & Society, and College of Education alum Roger Quiñonez, chair of the City Academy Mathematics Department. Gutiérrez and Quiñonez first conceptualized the symposium to foster connection and interdisciplinary learning among students and their families.

A Brief History of Math Learning

Gutiérrez explains how mathematics has historically been a difficult learning area for families—even traumatic, and certainly assimilatory. “Folks who grew up in another era may still have memories of violence and isolation associated with math learning,” he says. “That’s still in the DNA of math education.”

Gutiérrez and Quiñonez’s collaborative work challenges a history of family rupture at schools through mathematics, education, and putting in the time to build relationships that generate change. “We see the benefits of doing this work from the kid side and the family side. Students learn about social justice and advocacy. They also learn to make sense of data, summarize information, and communicate their ideas to their families and the general public,” says Gutiérrez. “It’s all about doing something different with mathematics,” Quiñonez explains. “And, more importantly, doing something different with our students. We cannot just focus on memorization and rote learning. Giving students a platform to voice their concerns for their community with mathematical analysis creates new perspectives for students. Layered with the family component, this event helps us to reimagine school mathematics.” And, perhaps the best part, parents get to see their children shine in unexpected ways.

At the symposium, mother Jocelyn E. Dolor remarked, “I love this event - this is my second time attending. It is a wonderful chance for students to practice their public speaking,” and leads to the development of both academic and communication skills. Her son’s project addressed a pressing question that many of us share: “Is There a Way We Can Restore The Great Salt Lake?” And his presentation poster was the result of months-long, in-classroom preparation directed by math teachers at City Academy.

Empowering Through Discovery

One City Academy special education math teacher, Lillian Scoville, participated in this year's event for the first time. Looking back on the months leading up to the event, she recounts how her students' projects began with a brainstorming session last December. She encouraged her students to focus on sociocultural issues that mattered to them personally, with an aim toward empowering students and helping them to take ownership of their learning.

"They became more interested in the mathematical aspects of it all because they got to choose something meaningful to them," Scoville says. She explains that while some students were initially hesitant, most ended up embracing the opportunity to explore topics deeply relevant to their lives and environments, not unlike RJ's choice to address efforts to restore the Great Salt Lake. This year's symposium featured a rich range of additional research topics, including the effects of vaping on teenagers, mental health awareness, food security, and homelessness in Utah.

For Bruce Abe, a City Academy math teacher participating for the second time, everyone benefits from the event:

"The students get to use math the way many of them will in their future lives, as a tool for making sense of data, in the context of a problem that's big enough to be worthy of study, and that is personally meaningful to them. Many of them aren't aware that they are using math as they do the work; hopefully we can broaden their idea of what math can do.

"The parents can see their students in an intellectual setting that they don't always get to see. Some of them might start thinking differently about possible futures. And it's just a chance for the whole community to get together and see what they share.

"And I know you didn't ask about benefits to the teachers and the school, but it gives us an energy and an antidote to end-of-year testing. We get to understand our students' interests, make connections, and imagine how to restructure curriculum to be more valuable in preparing students for this kind of future."

Building Skills for the Future

The symposium required students to apply mathematical tools to their chosen real-world problems. Scoville emphasized the importance of understanding data and graphs, encouraging her students to interpret and tell stories through their findings. Scoville described how students with different levels of understanding and abilities occasionally faced difficulties in narrowing down their research questions and comprehending complex data. It was her priority to ensure that each student could contribute to the event meaningfully, and at their own level. In the end, across proficiency levels, she saw students make significant strides in their ability to analyze and present data.

Scoville feels the event itself was a transformative experience for City Academy students and their families: "They had to step up, talk with intelligence, and take pride in their work," she observes. "I feel like

it was valuable for the students to see that they can understand complex situations and that they have someplace to go in their understanding.” She adds, “I think it helped them to gain some confidence.”

As many educators know, there is so much fear that surrounds learning, especially math. For Quiñonez, the solutions must include empathy and relationships: “We are human and deserve to engage in human experiences. Being able to create community and break bread with families to support their children is one of the highlights of this event. It’s a reminder to everyone that we can come together and focus on listening to create something better for our community.”

For Gutiérrez, “Observing and interacting with students and teachers [at the symposium] is truly one of the bright spots of my year...I marvel at how students share with such vulnerability. I’m grateful that I get to support the amazing teachers at City Academy. They work hard to create spaces that amplify student voices, where students can explore issues important to *them*.”

Looking Ahead

As this annual event garners more attention in the College of Education and local school districts, it is cementing itself as a powerful example of family involvement in mathematics education. With the College of Education’s funding and support, organizers hope to strengthen and grow this partnership into a long-lasting tradition that promotes the University of Utah’s goal of increasing its community presence.

For Quiñonez, the math symposium is not a final product but one part of a larger process. He explains that one of his goals is to create more opportunities to engage with families, get their input, and develop meaningful partnerships. “Learning and relationships must extend beyond technical aspects of the classroom,” Quiñonez insists, which is a long-term project for him. Reflecting on this year’s symposium, Scoville expresses excitement for future iterations. She plans to introduce “data days” throughout the upcoming school year, where students will regularly analyze graphs and charts to build their analytical skills incrementally. Additionally, she intends to develop a clear rubric to guide students in self-assessment, ensuring they understand their progress and areas for improvement.

But the real success of the symposium lies in students reaching their own goals and mastering their projects, even beyond their initial understanding of their chosen issue. As the teachers’ reflections show, fostering critical thinking and empowering students to explore their passions not only enhances their learning but also prepares them to contribute thoughtfully to their communities. It showcases math education as a powerful catalyst for personal and societal transformation, paving the way for a brighter, more informed generation.