From Diverse Online

Archives 1998
Visual mathematics - math for art students
By Joan Morgan
Jul 13, 2007, 17:04

Teaching math through art seems incongruous if you believe in the "right brain/left brain" theory. But disproving this apparent incongruency is the mission that John Sims, professor and coordinator of mathematics at the Ringling School of Art and Design in Sarasota, Fla., has undertaken.

"I don't buy into this left brain/right brain thing of art on one side and math on the other," Sims says. "Most people think that art and math are very separate, but they don't have to be. I want to present math as a creative enterprise and show that it can be taught creatively and visually."

Students attend The Ringling School to earn a bachelor of fine arts degree. The school -- founded in 1931 by John Ringling of circus fame -- is a private, independent, four-year college of visual arts and design. It also offers animation and technology training.

Sims, who has studied in Germany, is a working artist and mathematician who earned a math degree from Antioch College. He also is a Ph.D. candidate at Wesleyan University, where Ringling found him teaching calculus and offered him the opportunity to develop the school's math curriculum.

Sims's art has been exhibited around the country. This summer, he will present his ideas on "Pythagoras' Theorem, Triangles, Triples, and Art" -- and his "Time Sculpture: a 21st Century Clock" at conferences in Spain and Israel.

At Ringling, Sims has created courses such as visual mathematics, creative geometry, mathematics and physics for animators, and art and ideas of mathematics. Dr. Tina Beer, Ringling's dean of liberal arts, says Sims's approach to teaching both math and art has brought a new dimension to the campus -- not only in the implementation of his philosophy, but also in connecting the community outside the campus to Ringling and the larger world of art and design.

That is exactly what Sims's teaching did for former student, Chris Sampson, who says he barely made it out of high school geometry.

"[Sims's method] took something so abstract and made it so I could see it," Sampson says. "Looking at math like that really excited me. I started to lose my fear of math."

"My role as an educator, mathematician, and an artist is to show [students] the importance of mathematics to the visual arts," Sims explains. "I'm trying to tell art students, you can be analytical in your work and that mathematicians can be very expressive. Math can help them extend their sight' by confirming what the eyes can't see.

"We are now seeing that very often it is the artist [who] is asking the interesting questions that lead mathematicians to do some of their work," he adds.

This conflicts with the training of some artists, who disdain calculation.

"It's not about calculations, it's about understanding a process and repeating a process, creating symmetry, and making certain kinds of choices," Sims says. "And as [students] do that, they manipulate the process, notate the process, and they are doing visual mathematics, I'm teaching them mathematical thinking behavior. And you can apply it to lots of different things.

"I can see how this might affect the pedagogical landscape," he continues, "because this process is fun, engaging, and people come away feeling like creators."

And there is another benefit Sims sees in his teaching methods.

"So much of math at the undergraduate level is geared toward calculus -- which is geared toward doing physics, biology, and science," he says. "I'm not saying people don't need to take calculus,

but I think this is a wonderful supplement and also a wonderful core course for people who don't want to take those high level math courses."

According to Sims, there has always been a natural convergence of math and art. Even before the Renaissance, math brought what is called "perspective" or depth and dimension to art, he explains.

"Some of the first applied mathematicians were painters like Piero della Francesca and Giotto di Bondone, whose art reflected their notions of infinity and parallel lines and creating depth from a two dimensional surface," notes Sims. "Giotto, who lived in the fourteenth century, was one of the first to bring this to art."

One of Sims's main interests is ethnomathematics, which was introduced to him by retired MIT professor Dr. Dirk Struik. It explores the relationship between math, social structures, and the cultural activities of a community. It also looks at how mathematical ideas have been encoded into art work.

It's a wonderful way to teach math from a design point of view," says Sims, who has been influenced by Dr. Paulus Gerdes.

Gerdes is a world renowned expert in the field of ethnomathematics from the University of Mozambique. He will speak at Ringling as part of a lecture series Sims is creating for the school. An example of his influence which Sims has adopted is the African Defence motif -- which Sims took from Gerdes book, Ethnomathematics and Education in Africa, and uses to prove the Pythagorean theorem.

"The students love, it, For them, the mathematical learning experience becomes creative and empowering," Sims says.

Former student Anders Martensson agrees. "It has made math more interesting because I like art."

Sims is currently working on a textbook, Visual Mathematics, that is geared for artists. He also is planning a mathematical/art exhibition at the Selby gallery in Sarasota. And in the year 2000, an installation of his Time Sculpture -- a collection of chess sets, clocks, and vases -- will appear throughout Manhattan. The Time Sculpture will be strategically placed around the island and represents his vision of the nexus between art and time in the next millennium.

"In it, I'm trying to show how to use art and design work to get people stimulated and motivated about the mathematical process. Even traditional fine art such as portraits, it can be argued, involve art in the form of symmetry and proportions," he says.

Sims also plans to collaborate with Gerdes in creating an international center for mathematics, art, design, and education. Calling him very ambitious, Beers says Ringling wants to support Sims's idea for the center. But, she adds that fully realizing his vision will require a development strategy, for identifying potential funding sources.