

Regional

Reality of chemistry is far from stereotypes

Many people had their first experience with chemistry in high school. For some, the experience conjured up stereotypical images of “mad” scientists in white lab coats conducting dangerous experiments with hazardous materials. While this image is also reflected in many media portrayals, the real world work of chemists is quite different – and quiet essential to the world in which we live. Today more than ever, we need to have a better understanding of chemistry’s role in our daily lives. One way to do this is to re-imagine the way that chemistry is taught.

“The impression most people have about chemistry is the bad news of chemistry, the poisons, toxins, explosions,” said Eric Voss, a professor of chemistry at Southern Illinois University Edwardsville. “You hear about chemistry when all the bad things happen. I challenge students and teachers to think of everything around us as chemistry.” He said that he thinks that the quality of teaching chemistry in our schools is mixed, as are the results. And the quality of the students’ secondary education makes all the difference when they get to college. To this end, Voss works with state groups to help improve students’ preparation.

“Some come well prepared,” Voss said of incoming students at SIUE. “Some not so much. Something we want to do when working in the region with teachers is to improve the quality of students’ preparation. A survey among freshman chemistry students, those who had been prepared by teachers in our program, show that they did better overall than students who did not work with teachers from our program. On the other hand, I’ve had home-schooled students and if they’re motivated, there isn’t anything in the way of them picking up and doing well.”

Born in High Point, N.C., Voss grew up in Hinckley, Ill. He obtained his bachelor’s degree in chemistry from Northern Illinois University, and his master’s and doctorate in chemistry from Northwestern University.

One thing that Voss knows helps get and keep students interested in science is pioneering new technologies, and chemistry



Photo by Karen Ready

Dr. Eric Voss with one of his laboratory tools, an Atomic Force Microscope.

is no exception. Recently we have seen the introduction of nanotechnology - the study of the very small.

“A nanometer is one billionth of a meter, so you’re talking about a size domain that is very small,” he said. “There’s a lot of research in engineering, physics, and chemistry learning about what’s happening at the nano scale. Bringing cutting-edge technology into the classroom and the laboratory makes things more interest-

ing for the students. Some of my research that I do with my graduate students has to do with nanotechnology.” Given the growth in online education, one wonders if chemistry is a suitable subject to be taught online, given that its lab component is such hands-on oriented.

“I have friends who do homeschooling, and their biggest challenge is the laboratory work,” Voss said. “Some of them put together home kitchen labs

with chemicals that can be found in your home, but those chemicals can be more dangerous than those that we use in our labs. I think that some things can be taught through the computer with simulations, but definitely there still should be some hands-on laboratory work.” Although some students are afraid of chemistry labs, Voss explained that they could be designed in a way to make them fun.

Aldemaro Romero Jr. College Talk

“If you are interested in forensics you learn that in the lab we use a x-ray diffractometer, which can be employed to very precisely determine the composition of a powder,” he said. “The FBI can go to the scene of a crime where there has been an explosion. They can take sticky tape and get a sample of the powder to put in the x-ray diffractometer, and know what was actually there at the time. Here’s a real life application that might make it more interesting. Making sure that the curriculum is addressing modern issues and contexts will keep people interested. In chemistry and science we encourage our students to get into the lab as soon as possible. That’s what got me interested in chemistry. I had the opportunity as an undergraduate to work on a research project with a faculty member.” And that experience, Voss said, influenced the way he teaches chemistry today.

“Here at SIUE we teach students to learn about chemistry, instrumentation and hygiene in how to keep things clean. Although they aren’t necessarily going to go on doing the same things they did as an undergraduate, I think that it is good for problem solving,” he said. “Getting students into the lab is very important.” Chemistry teachers continue to face new challenges, Voss added.

“I think challenges that are going to be affecting educators of all kinds come mostly from the abundance of knowledge,” he said. “It will be hard to keep up with all of the new information.”

Aldemaro Romero Jr. is the Dean of the College of Arts and Sciences at Southern Illinois University Edwardsville. His show, “Segue,” can be heard every Sunday morning at 9 a.m. on WSIE, 88.7 FM. He can be reached at College_Arts_Sciences@siue.edu.