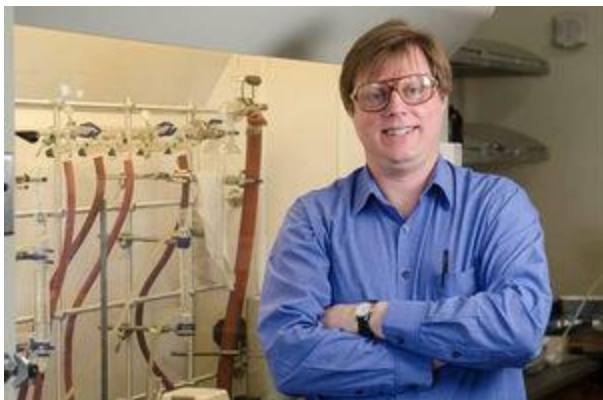


Science education enhanced by program



Eric Voss.

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Tune in to this week's episode of Segue on WSIE-FM 88.7 as Greg Budzban, PhD, dean of the Southern Illinois University Edwardsville College of Arts and Sciences, hosts Eric Voss, PhD, professor in the Department of Chemistry. Their discussion primarily explores the Southern Illinois Regional Science Network (SIRSN) program, established by SIUE in the late 1980s to improve the pedagogical techniques of regional

high school science teachers to provide enhanced college preparation and heighten student interest in laboratory sciences.

As a project director for this Illinois Board of Higher Education-funded program, Voss discusses his involvement with SIRSN, as well as recent developments made in the program to increase preparation and interest in the sciences for regional students at the elementary and secondary levels.

Attributing much of his career aspiration to the presence of passionate and engaged science teachers throughout his education, Voss completed his undergraduate work at Northern Illinois University before receiving his PhD in inorganic chemistry from Northwestern University. Following his education, Voss completed a post-doctoral fellowship at Brookhaven National Lab in New York, doing research for the U.S. Department of Energy for two years before joining the SIUE faculty in 1994.

“What was so appealing to me about coming here was the heavy focus we have on students,” Voss shares. “I can do my scholarship working with students, and my teaching is valued. It’s truly been a good experience for me to do that.”

Because of the impact science teachers had on Voss, his career has been dedicated to working with teachers in the region to pay it forward to the young minds of today through the SIRSN program. The program began by serving primarily high school chemistry teachers using content-based learning. The program has since evolved to include development opportunities in middle school sciences, high school chemistry, high school biology, high school physics, geology, earth science and other laboratory science disciplines. Because such workshops were less common in the state during the program’s infancy, teachers would often travel from as far as Rockford and other northern Illinois areas to attend SIUE’s SIRSN programming.

Today, the program is able to more intimately serve science teachers from all levels of education and across scientific breadths within a 60-mile radius, better preparing teachers on practical subject matter that is directly applicable to enhancing student preparation and scientific interests. Through this core group of more than 150 teachers, SIUE scientists and the SIRSN program have impacted the scientific and pedagogical techniques of more than 60 regional school districts, creating broad impact for the future of science education in the state.

“This program speaks to the many strengths of SIUE in regards to experiential learning and applied research,” Budzban notes. “As opposed to canned science experiments where everyone knows what the outcomes are going to be, these types of programs actually do research. There are standards now embedded in the program.”

As the SIRSN program continues to evolve, so do the standards and methodologies of science education. In 2013, a national change for Next Generation Science Standards was implemented. The initiative allowed

science education to descend to the middle school ranks through diversified laboratory science experiences, creating a cross-pollination of science disciplines to allow more in-depth science interests and preparation for students. Now focused upon the practices of science and engineering, disciplinary core topics, and cross-cutting concepts such as measurement and energy, the purpose of such pedagogical evolutions is to provide students with more creative and advanced cognitive thinking mechanisms for developing intellectual maturity.

Among the greatest challenges of these pedagogical innovations are the discomfort of experienced teachers toward the change, as well as student preparation for higher education through a more broad-based science education.

“For many teachers who have been teaching for 20 years or more, these Next Generation Science Standards are a big change,” Voss explains. “You talk to teachers who are just graduating university and they are prepared, because it’s a great part of how we train them in their pre-service time. However, if you have a teacher who’s already out in service and has been educating for several years, these new standards are quite a bit of change.”

Voss continues by sharing, “A big challenge is if you’re preparing students for university through an advanced placement class. Those courses are highly focused on discipline-specific knowledge, whereas these new standards have a much broader look. Because most students will not go on to become science majors, it makes sense to have this interdisciplinary look. However, that results in having a differentiated curriculum, where two often conflicting agendas are having to be dealt with. So the challenge right now is, ‘How do we integrate the standards, yet still ensure students are well-prepared?’”

To ensure students are engaged with science and possess a continued interest and preparation for its subject matter throughout the duration of their education, Voss believes laboratory science should descend even further in grade levels toward elementary education.

Budzban agrees by adding, “When I was growing up, I typically loved science and math. But I must admit, sometimes I would sit in a lab and the results of a particular experiment were obvious! It was like, ‘Okay, I’m going to take this block and slide it down this inclined plane and yeah, I know what’s going to happen.’”

“Now, part of the requirement and the demand in education is coming up with complex ideas to complex problems where the solution isn’t necessarily obvious. We lose so many students along the educational track by not keeping them engaged in the subject matter. These new methods and standards are keeping those students more engaged, which is great.”

The discussion concludes with Voss discussing the SIRS program’s next phase. Called the Every Student Succeeds Act, it encourages independent school districts to take professional development initiatives upon themselves rather than receiving them from the University. To support this initiative, four SIUE research teams are currently conducting case studies and pilot studies in regional high schools and middle schools to provide individualized recommendations and consultation on how participating school districts should develop their pedagogies under the Next Generation Science Standards.

Tune in to WSIE 88.7 FM every Sunday at 9 a.m. as weekly guests discuss issues on SIUE’s campus.

By Logan Cameron, SIUE Marketing & Communications