Undergraduates Teaching Chemistry through Outreach: Starting a Journey from Goodwill to Research-Based Practice

Ellen Yezierski, PhD
Professor of Chemistry
Miami University of Ohio

Wednesday, September 12, 2018
11:00 AM – 12:00 PM
ISC 3300

Outreach conducted by student chapters of the American Chemical Society and Alpha Chi Sigma reach almost one million audience members (mostly children) each year. There is a strongly held belief by chemists in the value of outreach (in this case, for participants and aspiring scientists facilitating outreach events); however, there is no evidence of its efficacy or even a rationale for promotion of outreach by the aforementioned organizations. Additionally, significant financial and human resources are devoted to outreach without a scholarly understanding of teaching and learning in this informal chemistry context, thus warranting investigation. Our goal has been to carefully characterize outreach carried out by the college students in these organizations by examining outreach content and facilitators’ purposes for conducting outreach, criteria for a successful event, training experiences, and chemistry conceptual understanding of common outreach activities. Our national survey of students (N = 194) and faculty (N = 105) from 153 institutions has informed a qualitative study employing a novel, rigorous, multimedia interview protocol that has captured a national sample (N = 37) of participants’ ideas. Survey results indicate the prevalence of a few common demonstrations done in outreach, multiple purposes for outreach (with some differences between faculty and students), and virtually no meaningful training or success criteria for events. Interview results indicate significant gaps in students’ foundational chemistry content knowledge and reveal students’ ideas about teaching that affect their ideas about content. Survey and interview results as well as implications for outreach, undergraduate chemistry teaching and learning, and chemistry education research will be presented.

Chemistry Department Sponsor: Prof. Hannah Sevian