Chemical engineering education currently undergoing a significant demographic shift, altering how students are taught, who is teaching them, and how those who hire them after graduation perceive their preparation. This talk will discuss the author’s involvement with these ongoing changes in chemical engineering education and practical ways faculty and others might respond.

At recent professional conferences, high-ranking engineering managers from chemical and related industry have lamented that while most new hires in chemical engineering enter the workforce with strong computational abilities, they frequently demonstrate weak conceptual understanding of principles they apply to their calculations. Moreover, there is also a frequently reported shortfall of communication, interpersonal, and business skills demonstrated by new hires. An AIChE Task force on Academic-Industrial Alignment (of which the author was a member) has examined this and related issues associated with undergraduate and graduate education of chemical engineers, and some conclusions and recommendations will be discussed along with subsequent input from a recent National Academy workshop considering the same topic.

Annual surveys taken of chemical engineering instructors of how various courses are taught in departments in the U.S. and beyond have revealed interesting data on who is teaching our courses. Courses with the most direct linkages to industrial practice appear to be increasingly taught by fewer instructors with industrial experience, and the number of chemical engineering faculty members with significant industrial experience appears to be decreasing. This talk will briefly discuss the shift that has appeared to have taken place in the chemical engineering professorate and possible secondary impacts related to the alignment of academic focus and industrial needs.

Finally, this talk will propose means of overcoming some of the obstacles to adoption of best practices in teaching by chemical engineering faculty with some examples of easy-to-adopt approaches (most of which the author has had a role in developing) that have been shown to be successful both in small and large classrooms.

Bio: David L. Silverstein is a Professor of Chemical & Materials Engineering at the University of Kentucky and Director of the College of Engineering's Extended Campus Programs in Paducah, Kentucky, where he has taught for 20 years. His PhD and MS studies in ChE were completed at Vanderbilt University, and his BSChE at the University of Alabama. Silverstein’s research interests include conceptual learning tools and training along with modeling of interfaces in porous media, and he has particular interests in contributing to the professional development of faculty members as educators. He serves as the Section Editor for Class & Home Problems for Chemical Engineering Education, was the chair of the organizing committee for the ASEE Chemical Engineering Division 2017 Summer School for Chemical Engineering Faculty, the founding chair of the AIChE Education Division, and winner of multiple awards from ASEE and AIChE for teaching, service, and scholarship in engineering education.

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