

2025

ASEE Annual Conference

DISTINGUISHED LECTURE



Dr. Karl A. Smith

University of Minnesota
Twin Cities

**Major Shifts in
Engineering Education
and their Implications**



Wed. June 25, 2025

8:00 AM to 9:30 AM

Montreal B, Westin Montreal



Education Research & Methods Division
Design in Engineering Education Division

ABOUT THE SPEAKER

Dr. Karl A Smith University of Minnesota Twin Cities

Karl A. Smith is Emeritus Cooperative Learning Professor of Engineering Education, School of Engineering Education, at Purdue University. He is also Emeritus Professor of Civil, Environmental, and Geo- Engineering, Morse-Alumni Distinguished University Teaching Professor, and Faculty Member, Technological Leadership Institute at the University of Minnesota. He joined the University of Minnesota in 1972 and started his academic career as a materials processing engineering researcher. In 1991 he changed careers to focus on engineering education research and in 2006 he accepted a part time position as Cooperative Learning Professor, School of Engineering Education, Purdue University to help start the engineering education PhD program in the College of Engineering. His research and development interests include building research and innovation capabilities in engineering education; faculty and graduate student professional development; and the role of cooperation in learning and design. Karl has over 40 years of experience working with faculty to redesign their courses and programs to improve student learning. He adapted the cooperative learning model to engineering education and has helped many faculty and graduate students with implementation. He wrote or co-wrote eight books including How to model it: Problem solving for the computer age, Cooperative learning: Increasing college faculty instructional productivity, New paradigms for college teaching, Strategies for energizing large classes: From small groups to learning communities, Active learning: Cooperation in the college classroom, and Teamwork and project management. His bachelor's and master's degrees are in metallurgical engineering from Michigan Technological University and his Ph.D. is in educational psychology from the University of Minnesota.

SESSION DESCRIPTION



Several shifts have occurred in engineering education in the US since the first program at the US Military Academy at West Point in 1802. Major shifts between 1802 and 2012 included:

- a shift from hands-on and practical emphasis to engineering science and analytical emphasis,
- a shift to outcomes-based education and accreditation,
- a shift to emphasizing engineering design
- a shift to applying education, learning, and social-behavioral sciences research, and
- a shift to integrating information, computational, and communications technology in education.

These shifts are described and their implications are explored from both a national and a personal perspective. More recent shifts including (6) a shift to (emergency) remote learning due to the Covid-19 pandemic, and (7) a shift to emphasizing justice, equity, diversity, and inclusion as well as current and emerging shifts are discussed.

For those interested in: Advocacy and Policy and Broadening Participation in Engineering and Engineering Technology

Moderated by

Dr. Alejandra J. Magana and Dr. Bruce Carroll



PAST DISTINGUISHED LECTURES

in the
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2001 – John D. Bransford	2025–Karl A. Smith
2002 – Sue Rosser	
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