

HELPING STEM STUDENTS DEVELOP HIGH-LEVEL SKILLS

Richard M. Felder

Hochst Celanese Professor Emeritus of Chemical Engineering

North Carolina State University

Rebecca Brent

President, Education Designs, Inc.

Cary, North Carolina

This workshop provides tools and strategies for STEM faculty members to help their students acquire and improve skills in analytical problem solving skills and professional skills, with the latter including skills in critical and creative thinking, communication, and teamwork. The workshop addresses these questions:

- How do I clearly define my expectations for students' performance in targeted skill areas and clearly communicate those expectations to the students?
- How can I use active and inquiry-based learning to help students develop skills to analyze and solve complex problems?
- What is critical thinking? Why is it an essential skill in STEM professions?
- How can critical thinking, creative thinking, and communication skills be taught and assessed effectively? How can instruction in those skills be integrated into core STEM courses, assignments and projects, and exams?
- What are teamwork skills? How can students be equipped with them? How can individual contributions to team projects be assessed and taken into account in grading?
- What does research say about the teaching methods recommended for instruction in the targeted skills? What forms might STEM student resistance to that instruction take, and how can the resistance be minimized or eliminated?

Faculty who attend this workshop should already know the basics of active learning and writing as well as using learning objectives at different levels. This workshop will build on these concepts. For more information about active learning, please [read this short paper](#) provided by the facilitators.

Rebecca Brent, Ed.D.

President, Education Designs, Inc.

Email: rbrent@mindspring.com, **Twitter:** @RebeccaBrent

Dr. Brent has more than 35 years of experience in education. She specializes in staff development in engineering and the sciences, teacher preparation, and evaluation of educational programs at both precollege and college levels, and holds a Certificate in Evaluation Practice from the Evaluators' Institute at George Washington University. She coordinated faculty development in the NSF-sponsored SUCCEED Coalition from 1997 to 2003 and new faculty orientation in the Colleges of Engineering and Sciences at North Carolina State University from 2000 to 2013. She has authored or coauthored roughly 65 papers on effective teaching and faculty and teaching staff development. Prior to entering private consulting, she was an Associate Professor of Education at East Carolina University, where she won an outstanding teacher award. In 2014, she was named a Fellow of the American Society for Engineering Education.

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Richard M. Felder, Ph.D.

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North Carolina State University

Dr. Felder is coauthor of *Elementary Principles of Chemical Processes*, which has been used internationally as the text for the introductory chemical engineering course for over three decades, and he has authored or coauthored over 300 articles on chemical process engineering and engineering and science education. He has won numerous awards for his teaching, research, and publications, including the American Institute of Chemical Engineers Warren K. Lewis Award for Contributions to Chemical Engineering Education, the International Federation of Engineering Education Societies Global Award for Excellence in Engineering Education (first recipient), and the American Society for Engineering Education Lifetime Achievement Award in Engineering Education (first recipient). For a bibliography of his papers and reprints of his columns and some articles, access his website at www.ncsu.edu/effective_teaching.

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Drs. Brent and Felder are coauthors of *Teaching and Learning STEM: A Practical Guide* (Jossey-Bass, 2016). Separately and together, they have presented over 450 workshops on effective teaching, course design, and mentoring and supporting new faculty members, on campuses around the world, and they co-directed the American Society for Engineering Education National Effective Teaching Institute from 1991 to 2015. Visit their Facebook page at www.facebook.com/felderandbrent.