

ASEE Plenary 2011 – Opening Remarks – Karl A. Smith

**Slide 1:** Thank you Renata. I am honored to serve as MC for this important event and celebration. We're celebrating the 100<sup>th</sup> Anniversary of the Journal of Engineering Education and the final phase of the Jamieson/Lohmann Report. ASEE has been a pivotal part of my professional life for almost 40 years. Last year I became a Life Member (Age + Years as ASEE member  $\geq$  100). Thanks to ASEE President Renata Engel for initiating this celebration and inviting me to be a part of it, and to Journal of Engineering Education (JEE) Editor Jack Lohmann for all the help in planning. Hats off to the six invited presenters who will highlight evidence-based promising instructional practices that help close the loop between research and practice. And finally, my most heartfelt thanks to Jeff Froyd for all his terrific work organizing and orchestrating the plenary.

**Slide 2:** In this plenary we are featuring one big idea – Engineering Education Innovation – and Two perspectives - systematic engineering education research AND closing the loop between research and practice. The last 10 years have been extraordinary for engineering education research and innovation; and it has been marvelous to be a part of it, especially the launch of the engineering education PhD program at Purdue. The triangle representing connecting theory, research evidence and practice was introduced in 2004 at our first Rigorous Research in Engineering Education workshop. Ruth Streveler and I conceived of the idea of helping interested faculty learn more about EER and provide opportunities for them to partner with social science researches about two years earlier. Barbara Olds suggested that we ask ASEE to serve as the PI on the NSF grant proposal and the 3-year project was funded. We ran EER workshops and worked with about 50 faculty each year from 2004 to 2006. Raise your hand if you were among the 150 faculty who participated. (Russ Pimmel, our NSF program officer was among the first group of participants. Thanks for your feedback and support, Russ and best wishes in your retirement.) We are now in our second NSF funded phase and are conducting workshops at ASEE and FIE conferences, and providing access via our Collaboratory for Engineering Education Research (CLEERhub.org). JEE has embraced our approach we are partnering to provide workshops to faculty groups around the world, primarily in association with engineering education professional societies.

The background on the Jamieson/Lohmann report was summarized by Renta Engel in her description of the plenary. It began in about 2004 with conversations about increasing ASEE's presence in the conversation about engineering education, and continuing the tradition of ASEE involvement in periodic reports on engineering education. There had been reports about every 10 years from 1918 to 1968 – Mann, Wickenden, Hammond, Grinter, Walker. The Walker report (Goals of Engineering Education was published in 1968) and many of us felt it was time to launch another study. The 2009 Jamieson/Lohmann Phase I report, Creating a Culture for Scholarly and Systematic Innovation in Engineering Education, has been analyzed, discussed and researched. Leah and Jack will be providing a briefing on the final phase of the project at their plenary Wednesday morning. Scholarly and systematic innovation is at the heart of the project. My favorite definition of innovation is from Denning and Dunham (2009) who claim that innovation is “the adoption of a new practice in a community.”

**Slide 3:** I'd like to provide a little hopefully relevant nostalgia about my engineering education innovation and the adoption of a new practice in a community. In 1972 I was hired as a materials processing engineering researcher by the University of Minnesota. A short time later I was assigned a third-year course on thermodynamics and kinetics, which I approached using the only teaching method I had ever experienced – lecture, homework, exams (pour it in). It didn't work very well; students asked questions that revealed they didn't have a clue what I was talking about (I suspect many of you have experienced this). My engineering experience in industry and in research settings prompted me to look for better ways. I started talking with colleagues in ASEE and looking around the University of Minnesota. I discovered a treasure trove in the College of Education and identified cooperative learning as promising for engineering education in about 1974. (keep it flowing) My initial experience with cooperative resonated very deeply since this is the way I worked as an engineer on the job and in the research lab – overriding common goal and individual accountability. I studied and applied David and Roger Johnson's conceptual cooperative learning model in my classes. Mike Prince will summarize the 5 research-based key elements – positive interdependence, individual and group accountability, promotive interaction, teamwork skills, and reflection and group processing. I introduced cooperative learning in

1981 at the FIE conference and in my first JEE article (included with the resources on the Conference website). It took over 20 years for cooperative learning to become widely practiced. One of the purposes of this plenary is to look for ways to reduce the time for the adoption of evidence-based promising practices. Transforming engineering education is getting a lot of attention right now – NSF (TUES), White House Office of Science and Technology Policy – and to spark ideas we have designed this session with six presenters sharing their experience with evidence-based pedagogical practices.

**Slide 4:** Here is the agenda for the presentations. Each presenter will have up to 10 minutes and after each pair of presentation there will be an opportunity for you to reflect on what you've heard, identify practices that resonate, and develop plans for follow up. There will be no introductions (bios are available on the Conference website) and will be instantaneous transitions between presenters. Please note that we asked the presenters to do the near impossible, that is, to summarize and highlight evidence-based promising practices with 5-7 slides and in 10 minutes. Once they realized what they had gotten in to they grumbled a bit, but they produced excellent summaries that you give you the flavor of these ideas. This is about faculty decision making about teaching, especially designing learning environments and opportunities and our goal is to help you make informed decisions. The Center for the Advancement of Engineering Education final report is included on the resource list and it has an excellent section on Faculty Decision Making. There are three pairs of presentation with a brief opportunity for reflection after each pair. First there is a segment on active and cooperative learning and problem based learning with Mike Prince and Khairiyah Mohd Yusaf, then a segment of design with Jackie Sullivan and Arnold Pears, and finally a segment on assessment with Dave Darmofal and Anna Dollar.

**Slide 5:** Close and next steps. Two follow up sessions as noted. Most of the presenters will be attending session M722A – A celebration of the EER and will be available for follow up conversations in person or online. Please join me in thanking our presenters for their wonderful work.

Reflection and Processing Slide: reflect on what you've heard, identify practices that resonate, and develop plans for follow up.