

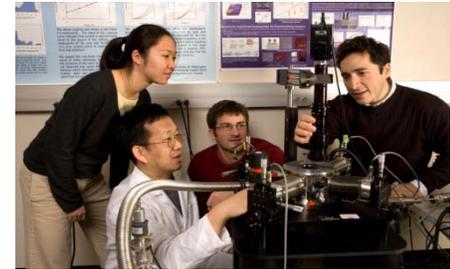
CAEE is a higher education Center for Learning and Teaching funded by the Directorate for Education and Human Resources and the Directorate for Engineering. Begun in January 2003, supplemental funding from NSF supported research activities through 2009.

- **STUDENTS:** Providing significant **insight into the learning of engineering across diverse student populations** and environments through **longitudinal, cross-sectional, and targeted studies**; portfolio tools created to assist engineering **graduate students prepare for careers in teaching**.
- **FACULTY:** Enhancing the effectiveness of strategies to **help engineering educators improve their teaching**.
- **RESEARCHERS:** Fostering a **diverse cadre of leaders and change-agents in engineering education** who can conduct high impact research.

## NUGGETS from CAEE Research

### STUDENTS: Learning and Pathways To Engineering

- seniors' use of language becomes more engineering design-specific and the orientation of their narratives shifts from an immediate solution to the design process Atman et al. Characterizing Design Learning Through the Use of Language: A Mixed-methods Study of Engineering Designers. *Journal of Engineering Education* 2008.
- seniors are less satisfied with instructors, although they interact with them more Sheppard et al. Exploring the Engineering Student Experience: Findings from the APPLE Survey. *CAEE Technical Report TR-10-01*.
- some students remain uncertain about what it means to be an engineer even in their fourth year Matusovich et al. I'm Graduating This Year! So What IS an Engineer Anyway? *Proceedings of the 2009 ASEE Conference*.
- college students navigate through engineering programs in ways that display large and consequential variation Stevens et al. Becoming an Engineer: Toward a Three Dimensional View of Engineering Learning. *Journal of Engineering Education* 2008.



- over the four years of their engineering education, male students have higher confidence than women in their math and science abilities and their ability to solve open-ended problems Chachra et al. Exploring Gender and Self-confidence in Engineering Students: A Multi-method Approach. *Proceedings of the 2009 ASEE Conference*.
- in their approaches to an open-ended design problem, women considered problem context more broadly than men did Kilgore et al. Considering Context: A Study of First-Year Engineering Students. *Journal of Engineering Education* 2007
- 80% of the Longitudinal Cohort reported that race had no impact on their engineering aspirations Fleming et al. Engineering Students Define Diversity: An Uncommon Thread. *Proceedings of the 2008 ASEE Conference*.
- today's college graduates think more about their "first job" than about a lifetime career choice Lichtenstein et al. An Engineering Major Does Not (necessarily) an Engineer Make: Career decision-making among undergraduate engineering majors. *Journal of Engineering Education*, 2009.
- many newly hired engineers do not anticipate the high level of social and organizational influence on their work Korte et al. A Qualitative Study of the Early Work Experiences of Recent Graduates in Engineering. *Proceedings of the 2008 ASEE Conference*.

### FACULTY: Research Into Effective Teaching Practices

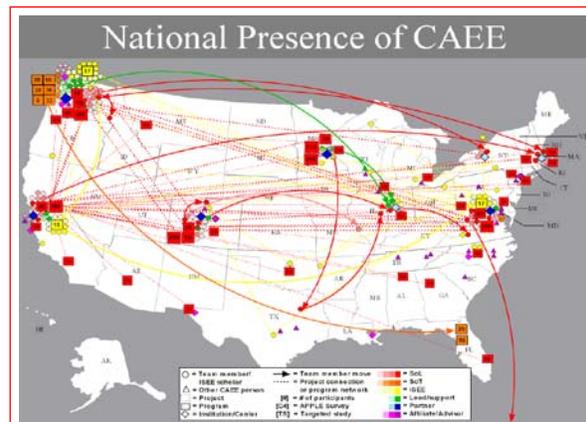
- differences in students that educators pay attention to are often not aligned with the differences that education researchers or educational policy makers suggest they should address Sattler et al. How Do Engineering Educators Take Student Difference into Account? *Proceedings of the 39th FIE Conference (2009)*.
- while explicit concerns for addressing student motivation were infrequent in educators' accounts of self-selected teaching decisions, many of the educators' reported actions (e.g., demonstrating relevance and creating a supportive classroom climate) are theoretically and empirically linked to positive enhancement of student motivation Turns et al. How Engineering Educators Take Student Motivation into Account. *Proceedings of the 2009 REES*

### RESEARCHERS: Building the Engineering Education Research Community

- storytelling provides a method for scholarly discourse in engineering education to make implicit knowledge more explicit, promote reflective practice, and provide entry points into a community of practice Adams et al. Storytelling in Engineering Education. *Proceedings of the 2007 ASEE Conference*.
- membership in a community of practice plays a pivotal role supporting the development of an often complex, interdisciplinary engineering education research identity Allendoerfer et al. Becoming an Engineering Education Researcher: Finding Pathways Toward Interdisciplinarity. Paper presented at the 2007 American Educational Research Association Annual Meeting, Chicago, Illinois, April 9-13, 2007.

**Leadership Team:** Cindy Atman (PI), Jennifer Turns, Phil Bell, University of Washington; Lorraine Fleming, Howard University; Sheri Sheppard, Larry Leifer, Stanford University; Ron Miller, Colorado School of Mines; Karl Smith, University of Minnesota/Purdue University; Reed Stevens, Northwestern U.; Robin Adams, Ruth Strevler, Purdue University

**National Affiliates:** NACME (National Action Council for Minorities in Engineering), WEPAN (Women in Engineering ProActive Network), CASEE (Center for the Advancement of Scholarship on Engineering Education), CIRTL (Center for the Integration of Research, Teaching, and Learning)



### The People of CAEE

- 60 faculty members and staff, 38 graduate students, and over 40 undergraduates involved in CAEE research, 2003-2009.
- 47 ISEE Scholars, representing 21 academic institutions, were part of three year-long Institutes for Scholarship on Engineering Education, 2004-2007.

**Center for the Advancement of Engineering Education  
Poster Citations**

- Adams, Robin, Cheryl Allendoerfer, Tori Rhoulac Smith, David Socha, Dawn Williams, and Ken Yasuhara. 2007. Storytelling in Engineering Education. In *Proceedings of the American Society for Engineering Education Annual Conference, Honolulu, Hawaii, June 24-27, 2007*.
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- Korte, Russell, Sheri D. Sheppard, and William C. Jordan. 2008. A Qualitative Study of the Early Work Experiences of Recent Graduates in Engineering. In *Proceedings of the American Society for Engineering Education Annual Conference, Pittsburgh, PA, June 22-25, 2008*.
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- Sheppard, Sheri, Shannon Gilmartin, Helen Chen, Krista Donaldson, Gary Lichtenstein, Ozgur Eris, Micah Lande, and George Toye. 2009. Exploring the Engineering Student Experience: Findings from the Academic Pathways of People Learning Engineering Survey (APPLES). *CAEE Technical Report TR-10-01*.
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