CAEE
RESEARCH · LEARNING · TEACHING · DIVERSITY · COMMUNITY
CENTER FOR THE ADVANCEMENT OF ENGINEERING EDUCATION

University of Washington (lead)
Colorado School of Mines
Howard University
Stanford University
University of Minnesota

ENABLING ENGINEERING STUDENT SUCCESS

The Final Report for the Center for the Advancement of Engineering Education

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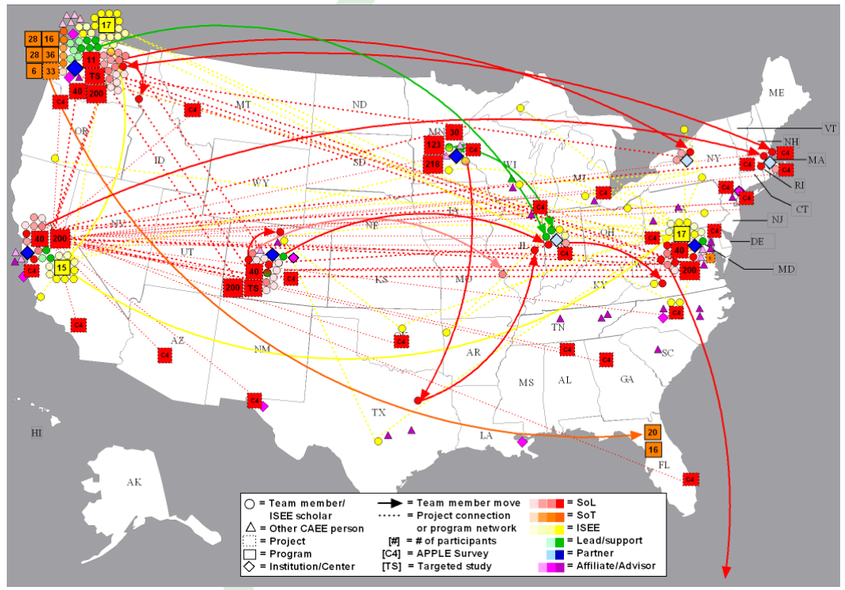
The Center for the Advancement of Engineering Education is a higher education Center for Learning and Teaching funded by the NSF's Directorate for Education and Human Resources and the Directorate for Engineering. Begun in 2003, CAEE received supplemental funding from NSF to support research activities into 2010.

CAEE focused on three groups in engineering education:

- **STUDENTS:** Providing significant insight into the learning of engineering across diverse undergraduate populations and environments through longitudinal, cross-sectional, and targeted studies; creating a portfolio program to assist engineering graduate students in preparing for teaching
- **FACULTY:** Providing insight into how engineering educators make teaching decisions and engage in effective teaching practices
- **RESEARCHERS:** Fostering a diverse cadre of leaders and change agents in engineering education who can conduct high impact research

CAEE's national presence



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

Selected highlights from CAEE research

Student Learning and Pathways to Engineering

Engineering students are as likely as students in other disciplines to **persist** in their majors.

Students remain **uncertain** about what it means to be an engineer, even in their fourth year.

Top **motivational** factors for engineering students are behavioral, psychological, social good, and financial.

Students who stay in engineering are **similar** on many measures to those who switch out.

Male engineering students start college with higher **confidence** than women in math/science and open-ended problem solving. This difference does not change over the four years of their education.

In their approaches to an open-ended design problem, women considered problem **context** more broadly than men did.

Some students struggle with the **shift** from "book problems" to open-ended problems.

College students navigate through engineering programs in ways that display large and consequential **variation**.

Seniors are less satisfied with **faculty and TAs** than first-years are, although seniors interact with faculty and TAs more.

Seniors' use of **language** becomes more engineering design-specific.

Today's engineering graduates think more about a **"first job"** than about a lifetime career choice.

A sizeable fraction of engineering graduates are considering a future **outside** the field of engineering.

Many newly hired engineers do not anticipate the high level of **social and organizational** influence on their work.

Research into Effective Teaching Practices

Student differences that educators pay attention to are often not aligned with the differences that education research suggests they should address.

Educators engage in many practices linked to increasing students' **intrinsic motivation** to learn.

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.

Membership in a **community of practice** plays a pivotal role in supporting the development of an often complex, interdisciplinary, engineering education research identity.

CAEE reports online

The complete CAEE final report, *Enabling Engineering Student Success: The Final Report for the Center for the Advancement of Engineering Education*, is available for download on the our web site.

The technical report *Exploring the Engineering Student Experience: Findings from the Academic Pathways of People Learning Engineering Survey* (APPLES) is also available.

To download these reports and learn more about the Center for the Advancement of Engineering Education, please visit us on the web:

http://www.engr.washington.edu/caee/