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CAEE research is being undertaken by three interdependent research elements:

- **Scholarship on Learning Engineering (SoL)** has the goal of gaining significant insight into the learning of engineering across diverse student populations and environments.
- **Scholarship on Teaching Engineering (SoT)** seeks to enhance the effectiveness of strategies used to help engineering educators improve their teaching.
- The **Institute for Scholarship on Engineering Education (ISEE)** is fostering a diverse cadre of leaders and change-agents in engineering education who can conduct high impact research.

### Research Through September 2007

**Longitudinal study of the engineering learning experience from the students' perspective.**

**Academic Pathways Study (APS): four research Cohorts**
- 160 undergraduate engineering students on 4 CAEE Campuses (Cohort 1)
  - Data collection through 4 academic years.
  - Four primary data collection methods: survey, structured interviews, ethnographic interviews/observations, and engineering design tasks; additional data sources are student academic transcripts and exit interviews.
- **National surveys expand and validate Cohort 1 results (Cohorts 3 and 4)**
  - 800+ engineering students on 4 CAEE campuses surveyed Spring 2007 (Cohort 3).
  - Survey planned in early 2008 to students from approximately 20 US universities of varying characteristics (Cohort 4).

**Investigations of the transition from engineering undergraduate to practicing engineer (Cohort 2).**
- 30 early career engineers and 6 managers interviewed at a large automotive manufacturing firm during 2006-07.
- 11 entry level engineers in their first year interviewed at 3 aerospace firms and 2 public agencies during 2007.

**Insights into engineering teaching practices.**

**Studies of Engineering Educator Decisions (SEED)**
- SEED research uses a decision-making lens to understand and impact engineering educators’ approaches to teaching.
- Data collection began in Fall 2006; interviews with 33 faculty completed by early 2007.

**Engineering Teaching Portfolio Program (ETPP)**
- Developing an understanding of how teaching portfolios help participants advance their teaching knowledge and abilities.
- Helping graduate students and postdoctoral fellows increase their preparation for engineering teaching; 150 participants in 7 offerings.

**Research instruments and models.**

**Research instruments**
- Broad interest from 2007 ASEE Conference attendees in using APS instruments on their campuses.
- APS Research Processes and Procedures: version for use by other researchers in work.
- Engineering Teaching Portfolio: curriculum and supplemental materials available on CAEE website.

**Models on how to conduct rigorous engineering education research.**
- Aspects of the ISEE model have been adapted and extended for use in other engineering education research training programs.
- Planning underway to have ISEE (week-long Summer Summit) materials available to the engineering education research community via CAEE website.

**Growth of the community of engineering education research scholars.**

**Institute for Scholarship on Engineering Education (ISEE)**
- A year-long, intense, interactive, and hands-on approach for impacting engineering education in a scholarly way.
- 47 Scholars have participated in the three Institutes, representing 23 academic institutions; third and final Institute cycle concluding in 2007.
- Special interactive session at the 2007 FIE Conference featuring the 2006-07 Scholars discussing their ISEE research projects.

**CAEE Research Team**
- 43 faculty members, 22 graduate students, and 28 undergraduate students from across the country have participated in CAEE research.

**Data-driven impact locally on CAEE campuses and nationally.**

**Impact on CAEE campuses**
- UW College of Engineering advising changes, CSM curriculum review, Stanford engineering fundamentals review, University of Minnesota Cohort 1’.

**National presence**

**Investigators:** Cindy Atman (PI), Reed Stevens, Jennifer Turns, Phil Bell, University of Washington; Lorraine Fleming, Howard University; Larry Leifer, Sheri Sheppard, Stanford University; Ron Miller, Barbara Olds, Colorado School of Mines; Karl Smith, University of Minnesota-Purdue University; Ruth Streveler, Robin Adams, Purdue University

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

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