Project to Assess Climate in Engineering (PACE)

Selected results from UW-Madison
Motivation

“The goal is to identify and address university climate issues to improve retention for all undergraduate engineering students”

- Special emphasis on women and underrepresented minority students
- Provides benchmarking with other “peer” universities
PACE Study

- PI is Suzanne Brainard at the University of Washington
- 24 Engineering schools participated
  - University of Wisconsin-Madison and University of Washington participated on a pilot basis—student survey only
- Funded by Alfred P. Sloan Foundation and The Engineering Information Foundation
PACE Survey Content

- **Academic experiences**
  - Satisfaction with teaching
  - Satisfaction with professors
  - Satisfaction with TAs
  - Satisfaction with resources

- **Interpersonal experiences**
  - Interactions among students
  - Participation in student organizations
  - Experiences based solely on gender or race/ethnicity

- **Intrapersonal experiences**
  - Confidence
  - Career goals

- **Perceptions of Engineering**

- **Experiences of Transfer Students**
Response Rates

- Overall response rate: 36.3%
  - Women over-represented
  - Most non-white racial/ethnic groups under-represented
  - Freshmen over-represented/Seniors and super-seniors over-represented

- N=1,082
<table>
<thead>
<tr>
<th></th>
<th>PACE Respondents</th>
<th>All CoE Students</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>24.4%</td>
<td>17.5%</td>
</tr>
<tr>
<td>Male</td>
<td>75.6%</td>
<td>82.5%</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>African American/Black</td>
<td>1.3%</td>
<td>1.8%</td>
</tr>
<tr>
<td>American Indian/Alaska Native/Native</td>
<td>1.1%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Hawaiian/Pacific Islander</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian American/Asian</td>
<td>3.8%</td>
<td>6.3%</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>1.6%</td>
<td>2.4%</td>
</tr>
<tr>
<td>White/Caucasian</td>
<td>75.5%</td>
<td>78.5%</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>11.9%</td>
<td>3.2%</td>
</tr>
<tr>
<td>International Student</td>
<td>4.8%</td>
<td>7.2%</td>
</tr>
<tr>
<td>Targeted Minority</td>
<td>4.8%</td>
<td>6.4%</td>
</tr>
<tr>
<td><strong>Rank</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>23.3%</td>
<td>10.4%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>22.9%</td>
<td>21.9%</td>
</tr>
<tr>
<td>Junior</td>
<td>21.3%</td>
<td>24.8%</td>
</tr>
<tr>
<td>Senior+</td>
<td>32.4%</td>
<td>41.0%</td>
</tr>
<tr>
<td><strong>Mean GPA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High GPA*</td>
<td>37.0%</td>
<td>27.5%</td>
</tr>
<tr>
<td><strong>Transfer Student</strong></td>
<td>10.9%</td>
<td>11.3%</td>
</tr>
<tr>
<td><strong>Student Works</strong></td>
<td>58.5%</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Financial Need</strong></td>
<td>14.9%</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>CoE Student Organization</strong></td>
<td>40.2%</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

* A High GPA is defined as 3.5 or higher.
Analysis

- Analysis variables:
  - Gender, Race/Ethnicity, Class Year, GPA, Transfer Status, Financial Need/Student Works, CoE Student Organization Membership

- Within-CoE comparisons
  - T-tests, differences between means
  - $p<.05$ for significance
  - Open-ended responses to highlight significant findings

- CoE vs. peer institutions
  - Purdue University, University of Michigan, Pennsylvania State University
  - Response rates are 33%, 35%, and 23%
  - Only means reported. Differences between peers and UW-Madison are considered “significant” if a $\pm 0.2$ difference in means was reported for at least two of the schools (in the same direction)
Three Major Findings
(Non-)Finding #1

- Women students in CoE do not feel marginalized in lab groups
  - Asian students do, however
How often is lab work divided equally among lab group?

* CoE significantly different from Big-10 peers (see text)
Finding #2

- Asian students (all ethnicities) have consistently lower satisfaction with their CoE experiences
Satisfaction of Asian Students in the CoE: Selected PACE Items

- I have no desire to declare a non-engr major
- I intend to complete my engr degree
- I am confident in my ability to succeed in engr courses
- I am comfortable meeting with profs for help
- I feel like I am part of an engr community

* Significant difference $p<.05$; # marginal significance $p<.10$. 
Satisfaction of Women Students in the CoE: Selected PACE Items

- I have no desire to declare a non-engr major
- I intend to complete my engr degree
- I am confident in my ability to succeed in engr courses
- I am comfortable meeting with profs for help
- I feel like I am part of an engr community

* Significant difference $p<.05$. 
Singled Out Due To Race/Ethnicity
Asian students only

* CoE significantly different from Big-10 peers (see text)
Finding #3

Women CoE students report very high levels of experiencing differential treatment based on gender compared to women in Big-10 peer schools.
Singled Out Due To Gender
Women respondents only

Percent Responding "YES"

Singled Out: CoE 3 Peers (Avg)
Sexist Stereotypes: CoE 3 Peers (Avg)
SH by Faculty: CoE 3 Peers (Avg)
SH by Student: CoE 3 Peers (Avg)

* CoE significantly different from Big-10 peers (see text)
NOTE: SH=sexually harassed
Finding #3:

- Even the men notice:

  “I think it’s very commonplace for Engineering students to joke about women, and how few of them there are in Engineering. The jokes seem harmless to us (men), but I’m sure their [sic] not to those few women actually in the field.” (RID=243)
Singled Out Unfairly Due To Gender
Women respondents only

* Significant difference \( p < .05 \)
Facility Express Stereotypes About Men and Women
Women respondents only

* Significant difference $p < .05$
Sexually Harassed by a Faculty Member
Women respondents only

* Significant difference $p<.05$
Sexually Harassed by a Student
Women respondents only

Percent Responding "YES"

* Significant difference $p<.05$
Recommended actions

- Some sort of harassment training for student leaders of Engineering student groups
- More faculty oversight of activities within student orgs
- Education of faculty, staff regarding singling out of Asian students ("model minority"?)
- More inclusion of Asian students within the Engineering community—student groups, representation in Diversity Affairs Office, etc.?
WISELI
Women in Science & Engineering Leadership Institute
University of Wisconsin-Madison