Being and Becoming:
Gender and Identity Formation of Engineering Students

Center for the Advancement of Engineering Education

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Engineering identity
Group identification

Survey constructs:  Centrality
                Private Regard
                Public Regard
                Group Identification

Based on Multidimensional Inventory of Black Identity
and Group Identification Scale

Survey results

First-years and sophomores only.
Few differences by gender.

During sophomore year:

Women reported a higher degree of centrality of identity than men ($p<0.1$).

Men reported a higher perception of public regard for engineers ($p=0.07$).
What is engineering?

Does everyone define and perceive engineering similarly?

Tension between ‘technicist’ view and technical/social practice [Faulkner 2007]
Perception changes over time

“In your own words, would you please define engineering?”

<table>
<thead>
<tr>
<th></th>
<th>First-year</th>
<th>Junior</th>
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</thead>
<tbody>
<tr>
<td>Designing/creating/building</td>
<td>40.5%</td>
<td>22.0%</td>
</tr>
<tr>
<td>Application of math and science</td>
<td>21.6%</td>
<td>19.5%</td>
</tr>
<tr>
<td>Problem solving</td>
<td>20.3%</td>
<td>28.0%</td>
</tr>
<tr>
<td>Improving humankind</td>
<td>8.1%</td>
<td>13.4%</td>
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Important design activities: first-year

Understanding the problem
Communicating
Planning
Brainstorming
Testing
Goal Setting
Using creativity
Making decisions
Visualizing
Seeking Information
Evaluating
Building
Identifying Constraints
Generating alternatives
Imagining
Modeling
Prototyping
Abstracting
Making trade-offs
Synthesizing
Decomposing
Iterating
Sketching

Women (n=55)
Men (n=92)
Important design activities: fourth-year

- Understanding the problem
- Communicating
- Planning
- Brainstorming
- Testing*
- Goal Setting**
- Using creativity
- Making decisions
- Visualizing
- Seeking Information
- Evaluating
- Building**
- Identifying Constraints
- Generating alternatives
- Imagining
- Modeling
- Prototyping
- Abstracting
- Making trade-offs
- Synthesizing
- Decomposing
- Iterating
- Sketching

Women (n=39)
Men (n=64)
Gender and engineering activities

[Guys are different from girls, like when we are working on projects and stuff, and sometimes there’s – they have like one track mind where it’s like let’s just get through this and then we can go. And then – but then I guess when I’m in a group then I sort of have to pay attention to the little details surrounding it, like, oh, what about this, what about this, and maybe we have done this – maybe not get through everything in one sitting as they would like, but then consider more of the big picture sometimes.
What does all this mean?

Engineering identity is a moving target; perception changes with time. Men and women may not define engineering similarly. How does this affect engineering identity? Implications for recruitment and retention?
Revenge of the Nerdette

As geeks become chic in all levels of society, an unlikely subset is starting to roar. Meet the Nerd Girls: they’re smart, they’re techie and they’re hot.

*Newsweek (June 16, 2008)*
Acknowledgement

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