Investing in the Future: How to Retain Women in STEM

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Thank you!

Presenters

- Lora Leigh Chrystal

- Janine McCormick

Introduction

- Why are women in engineering leaving?
- How can colleges and companies can support/retain female engineers?
    - Onboarding
    - Retention
- Results/benefits of retaining more women in engineering
- Takeaways / actions

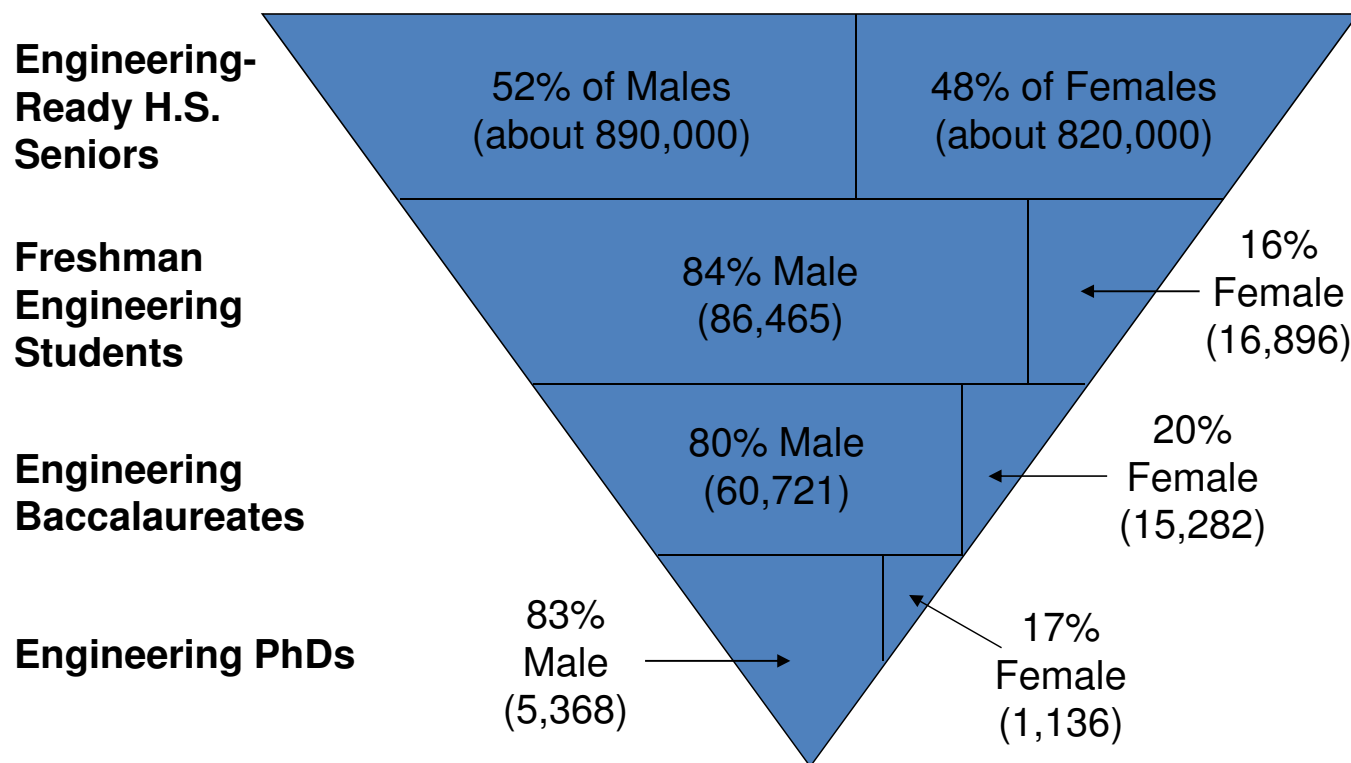**20%** of engineering graduates are women

11% of practicing engineers are women

Why the disparity?

The Educational Pathway for Women in Engineering

Engineering-Ready H.S. Seniors

52% of Males (about 890,000)   48% of Females (about 820,000)

Freshman Engineering Students

84% Male (86,465)   16% Female (16,896)

Engineering Baccalaureates

80% Male (60,721)   20% Female (15,282)

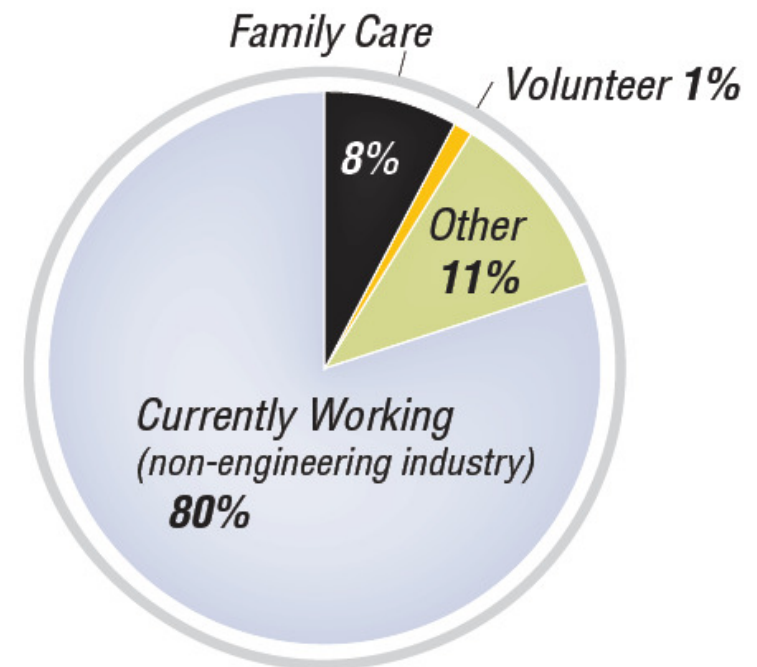**Engineering PhDs**

83% Male (5,368)   17% Female (1,136)

Why are women in engineering leaving? Some don't enter…

- Some never enter the engineering workforce in the first place
- Why?
  - Organizational climate
    - Lack of flexibility
    - Didn't like the culture
    - Management not appealing
  - Lack of interest
  - 20% never planned to enter & pursued other post-graduate degrees

- Where did they go?

Family Care

Volunteer 1%

8%

Other 11%

Currently Working (non-engineering industry) 80%

Why are women in engineering leaving? Some don't enter…

- One study finds these reasons why women never entered engineering for different graduation years

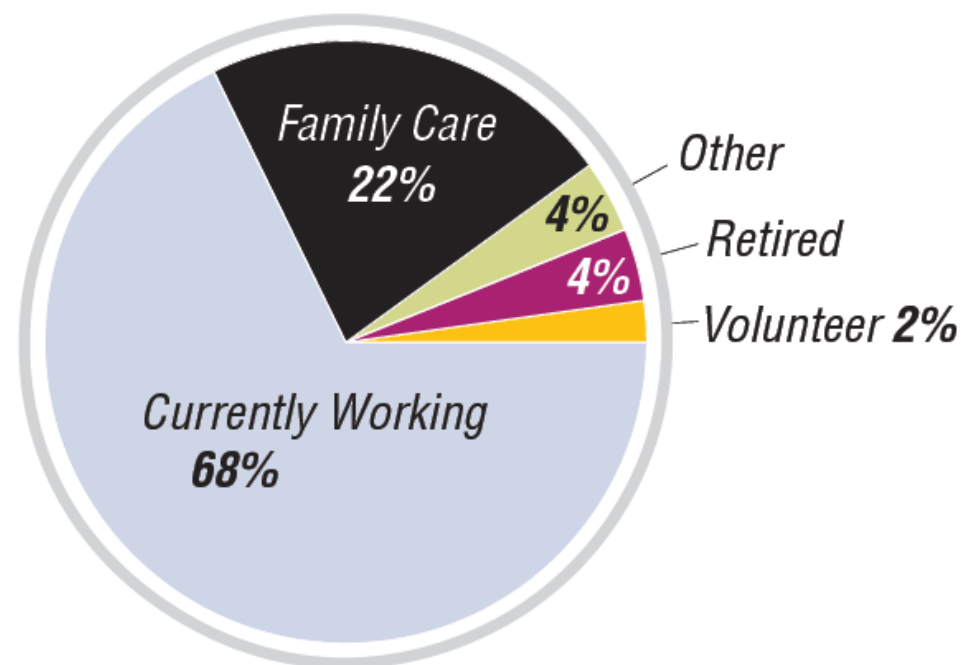| Reason For Not Entering	Before 1983	1984-1989	1990-1994	1995-1999	2000-2004	2005-2010	Total
couldn't find position	1	11	3	8	13	14	50
management not appealing	0	2	3	3	7	5	20
too difficult	2	3	4	5	4	8	26
low salary	1	2	8	17	11	8	47
no advancement	1	3	6	11	9	10	40
not flexible enough	2	2	6	7	14	14	45
never planned to enter	4	16	11	20	32	24	107
wanted to start own business	7	14	16	21	29	36	123
didn't like culture	4	13	18	28	27	29	119
not interested in engineering	9	25	24	34	46	32	170

Total Responses = 747 (Note: women could choose more than one reason)

Why are women in engineering leaving?

- Nearly 50% left because of working conditions
  - Too much travel
  - Lack of advancement
  - Low salary
- 30% left due to organizational climate
- 25% left because they wanted more time with family
- More than 2/3 are working in another field, half of those in executive positions
- Current & former engineers do not differ in marital or parental status, engineering major, salary level, or number of direct reports

- Where did they go?

Family Care 22%
Other 4%
Retired 4%
Volunteer 2%
Currently Working 68%

For the women who do enter:
To quote those that leave…

" In my experience, women leave engineering for **FAMILY REASONS**. I left engineering when I had my first child. I decided to stay home with my children…we moved to an area with very few engineering jobs. So I decided to go back to school and become a math teacher."

– Caucasian Electrical Engineering Graduate

" There isn't a strong network of females in engineering. You either need to learn to be "one of the guys" or **BLAZE THE TRAIL YOURSELF**, which is very difficult. I deviated from engineering… but work now in construction, where I am the only female executive officer."

– Caucasian Agricultural Engineering Graduate

" [There is no] opportunity for advancement in a male-dominated field- the culture of engineering is male-centric with **HIGH EXPECTATIONS** for travel and little personal time."

– Caucasian Chemical Engineering Graduate

How are colleges successful at supporting female engineers?

Programs like Women in Science & Engineering (WiSE) and Society of Women Engineers (SWE) work to eliminate barriers

- Isolation
  - Learning Communities: At Iowa State University, 87% of female engineers who participated in retention programs graduated in engineering vs. 61% who didn't

- Growth vs. Fixed Mindsets
  - Intelligence can be developed

- Professional development opportunities
  - Leadership conferences, leadership opportunities, interaction with companies

- Work to change the culture within education

How can companies hire more women & improve onboarding?

- Recruiting:
  - Sending diverse technical people to career fairs results in recruiting diverse people
  - Establish relationships at the schools that you recruit at with programs like WiSE
- Onboarding
  - Have an affinity group at your company
    - Isolation is a huge issue
      - Women in engineering are often the minority in the department, sometimes even the only one
    - Build a community for them of women or of new employees to foster them building lasting relationships within the company
  - Mentoring / sponsor programs
  - Professional development: talk onboarding and career planning with new employees
- Engage HR department in education of all employees
  - Stereotype Threat
  - Implicit Bias

How can companies retain their female engineers?

- Engage men in this conversation
  - UN "HeForShe" campaign
  - Adjust the culture / workplace climate so that all employees can thrive
- Networking options:
  - Many companies have women's groups
  - Support involvement in third party organizations like SWE, Lean In support groups
- Career planning

- Workplace flexibility
  - Mothers are 15% more interested in being a top exec than women without children
- Manager training: aware of best practices for working with women & the challenges they face
  - Feeling of isolation / imposter syndrome
    - Avoid relationship building events that exclude/alienate some employees
  - Subconscious bias / tendencies that research has shown

Road map to gender equality

- Track key metrics so you understand the problem
- Demonstrate that gender diversity is a top priority
    - Needs to be demonstrated at all levels of the company
- Identify and interrupt gender bias
    - Includes likeability, performance evaluation, performance attribution, and maternal biases
- Rethink work
- Create a level playing field
    - Create a virtuous cycle of female leadership

And those who've stayed in engineering and are happy in their roles:

- Most satisfied women engineers were those:
  - Received support from supervisors & co-workers
  - Ample opportunities for training & development
  - Saw clear paths for advancement

> **"** I am lucky to work for an organization that has **FLEXIBLE LEAVE** policies, in that I can take an hour off here or there if need be to deal with family issues.**"**
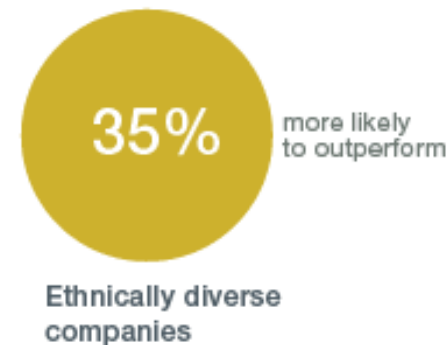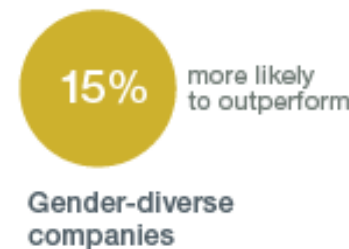> – Caucasian Mechanical Engineer

> **"** As a Latina, I felt engineering **OPENED MANY DOORS** for me to work internationally. I spent some time in Europe and Central America due to my work with prototype designs and my ability to speak Spanish.**"**
> – Latina Chemical Engineering Graduate

Business Results Achieved

- Hiring a demographically diverse workforce can improve a company's financial performance
  - More diverse companies are better able
    - To win top talent
    - Improve their customer orientation
    - Improve employee satisfaction
    - Improve decision making
  - All leads to a cycle of increasing returns
- The total cost of losing an employee can be tens of thousands of dollars to 1.5 to 2 times their salary

15% more likely to outperform

Gender-diverse companies

35% more likely to outperform

Ethnically diverse companies

Takeaways / Actions

- Recruiting:
  - Sending diverse technical people to career fairs results in recruiting diverse people
  - Establish relationships with programs like WiSE
- Affinity groups or mentoring/sponsor programs
- Offer and support workplace flexibility
- Career planning
- Engage everyone in this discussion to create a workplace climate that is supportive of all employees

Where To Get More Information

- SWE
  - http://societyofwomenengineers.swe.org/
- WEPAN
  - http://www.wepan.org
- LeanIn.org
  - http://leanin.org/
- Your company's women's network
- Stemming the Tide
  - http://energy.gov/sites/prod/files/NSF_Stemming%20the%20Tide%20Why%20Women%20Leave%20Engineering.pdf
- UN "HeForShe" campaign
  - http://www.heforshe.org/
- Women in the Workplace report (LeanIn & McKinsey&Company)
  - http://womenintheworkplace.com/ui/pdfs/Women_in_the_Workplace_2015.pdf?v=5

Thank You for Attending!

Enjoy the rest of the conference.