Diversity, Equity, and Inclusion in EECS Courses

Setting Your Students up for Success

The Diversity Committee of
Computer Science and Engineering

Today's presenters

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Today's Goal

Identify barriers to success for ALL of our students and discuss approaches and techniques for supporting their success in the department

Activity 1: Who is CS?

- Who has been traditionally included in Computer Science?

- How are people included/recruited/retained in CS?

- Discuss these ideas with your table.

Diversity = Numbers
Minorities in CS

According to recent statistics regarding the AP Computer Science A exam, the percentage of African-American students sitting for the test in 2018 was approximately 3.7%.

13% of the general united states population is Black.

https://research.collegeboard.org/programs/ap/data/participation/ap-2018

Diversity = Numbers
Minorities in CS

- Percentage of undergraduate degrees going to women: 57%

- Percentage of math and science undergraduate degrees going to women: 52%

- Percentage of Computer and Information Science undergraduate degrees going to women: 21%

Diversity = Numbers
Minorities in CS
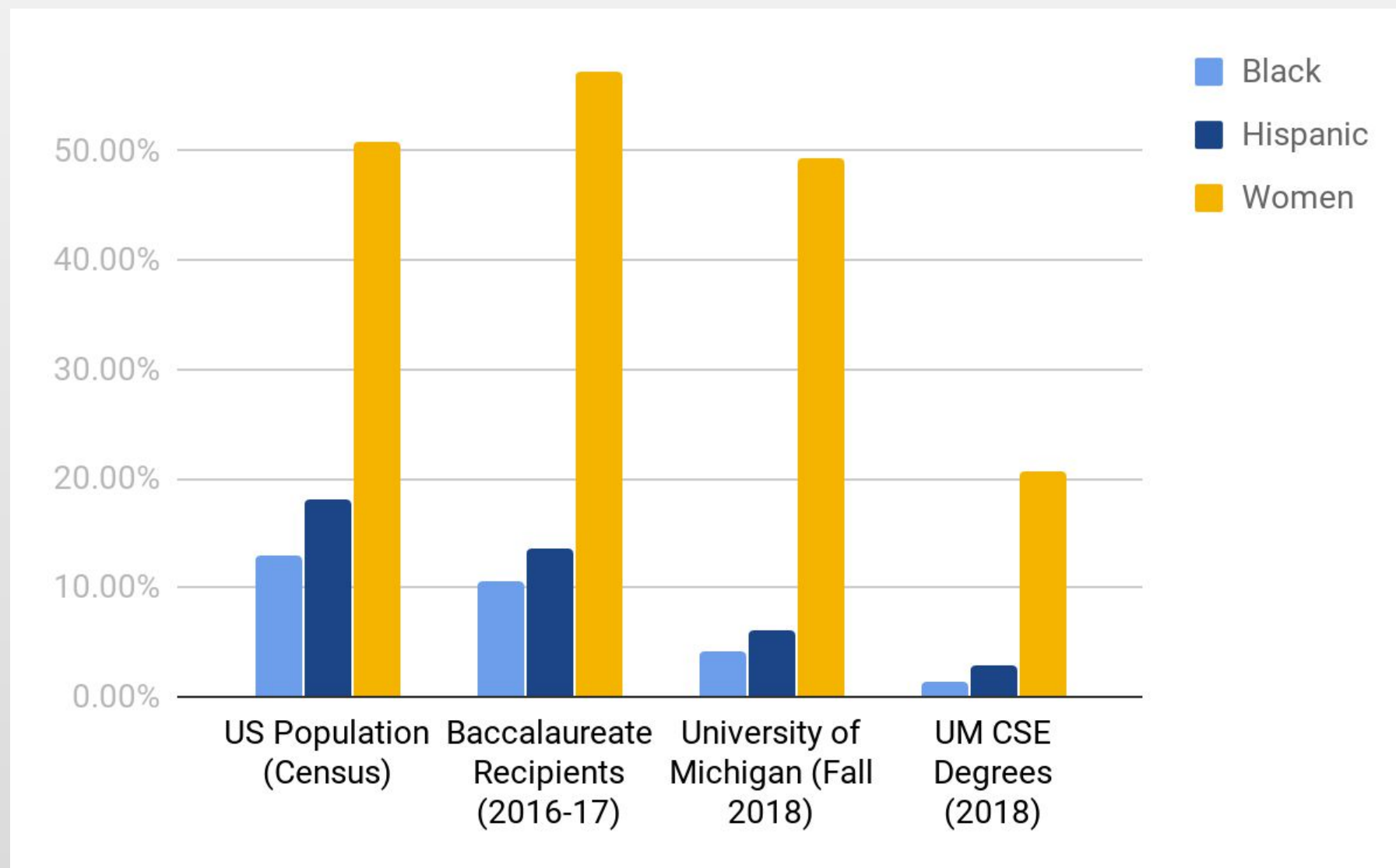
What are Equity and Inclusion?

Equity
provide to everyone the ***opportunities they need*** to succeed

Inclusion
Invite and encourage everyone to actively participate in the learning process

In short — set them ALL up for success

Some Barriers to Success

- Stereotype Threat

- Implicit Bias

- Impostor Syndrome

- The Myth of 'Essential Differences'

Activity 2: Stereotype Threat

- Consider the experiment presented on page 2 of the handout

- Answer the questions about the experiment on your own

- Discuss your answers in pairs (or threes)

Stereotype Threat
What is it?

- **Stereotype threat** "refers to being at risk of confirming, as self-characteristic, a negative stereotype about one's group"[1]

- Steele and Aronson (1995): showed in several experiments that Black college freshmen and sophomores performed more poorly on standardized tests than White students when their race was emphasized. **When race was not emphasized, however, Black students performed better and equivalently with White students.**

1. Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. Journal of Personality and Social Psychology, 69(5), 797-811. http://dx.doi.org/10.1037/0022-3514.69.5.797

Stereotype Threat

Stereotype threat predicts that **if** …

- You care about success in a particular domain, and
- One of your identities is associated with a negative stereotype about success in that same domain, and
- Elements of the environment make that particular identity salient

… **then:**

- The cognitive energy spent worrying (however unconsciously) that one might fulfill the negative stereotype increases the likelihood that one will **<u>underperform</u>** in that very setting.

Source: CRLT | CRLT-Engin

Combating Stereotype Threat

- Approach 1: **Deemphasize threatened social identities**

- Highlight their status as college students and veers away from the gender- and race-based ideas of ability.

- This increases participants' feelings of social belonging within the academic world and reduces stereotype threat and its damages.

Combating Stereotype Threat

- Approach 2: **Communicate high expectations and clear paths to achieving them**.

- This signals that students will not be judged stereotypically and that their abilities and "belonging" are assumed rather than questioned.

Combating Stereotype Threat

- Approach 3: **Use language that normalizes challenge and frustration**.

- Remind students that success can involve struggle.

- Emphasize that achievement on tests and assignments reflects **effort and commitment**, not intrinsic ability.

Implicit Bias - What is it?

- "We use the term **implicit bias** to describe when we have attitudes towards people or associate stereotypes with them without our conscious knowledge"[1]

- We develop implicit bias through living in society.

[1] https://perception.org/research/implicit-bias/

Combating Implicit Bias

- Take some implicit bias tests to see if you have any implicit biases https://implicit.harvard.edu/implicit/takeatest.html

- Use examples that apply to people all over the world; watch for language that assumes students will all have had the same experiences

- On your first day, *consciously choose* to assume that all your students will succeed

Implicit Bias

- **It is OKAY to possess implicit biases!** They are a product of the society and culture we grow up in.

- **It is NOT OKAY to let implicit bias lead you to discriminate against students who appear to belong to a group.**

- You are in a position of authority, and it is your job to ensure ALL students have the opportunity to succeed.

Impostor Syndrome - What is it?

- **Impostor syndrome** "is a collection of feeling of inadequacy that persist even in face of information that indicates that the opposite is true".[1]

- Proof of success is dismissed as luck, timing, or as a result of deceiving others into thinking they are more intelligent and competent than they believe themselves to be.

[1]·Caltech Student Counseling Services

Activity 3: Combating Impostor Syndrome

- Consider the statements on page 3 of the handout. Many of these reinforce impostor syndrome or stereotype threat.

- Discuss at your tables what you might say instead (or encourage students to say) to foster a more inclusive environment.

- **Hint**: reframing struggle and effort in terms of the **growth mindset** (intelligence is a developed skill) is a great way to combat impostor syndrome!

'Essential Differences' Myth - What is it?

- The 'Essential Differences' argument is that certain groups of people (e.g. men vs. women) are inherently better at different things.

- This is often seen in the belief that men are better than women at math and science, whereas women are better at verbal and communicative skills.

- A few of your students may hold this belief

'Essential Differences' Are Complete and Utter Crap

- Synthesizing data collected on more than 3 million participants between 1967 and 1987, the researchers found **no large overall differences** between boys and girls in math performance.
- As for verbal ability, in 1988, Hyde and colleagues found **no evidence** of substantial gender differences in any component of verbal processing.

More Proof They are Complete Crap

In a 2005 report, Hyde reviewed 46 different meta-analyses on sex differences, not only in cognition but also communication style, social and personality variables, motor behaviors and moral reasoning. In half the studies, sex differences were **small**; in another third they were **virtually nonexistent**.

Combating the 'Essential Differences' Myth

- Listen to your students. Correct people when you hear it, and speak when it is appropriate about disproving it.

- Remember: If you don't speak up, other students will assume that you agree with whatever was said.

Students may count themselves out

Perception vs. reality in CS Principles Programming Units

Female students   Male students

60%

40%

20%

0%

Perceived to be 'too difficult'   Enjoyed 'a lot'   Achieved over 70%
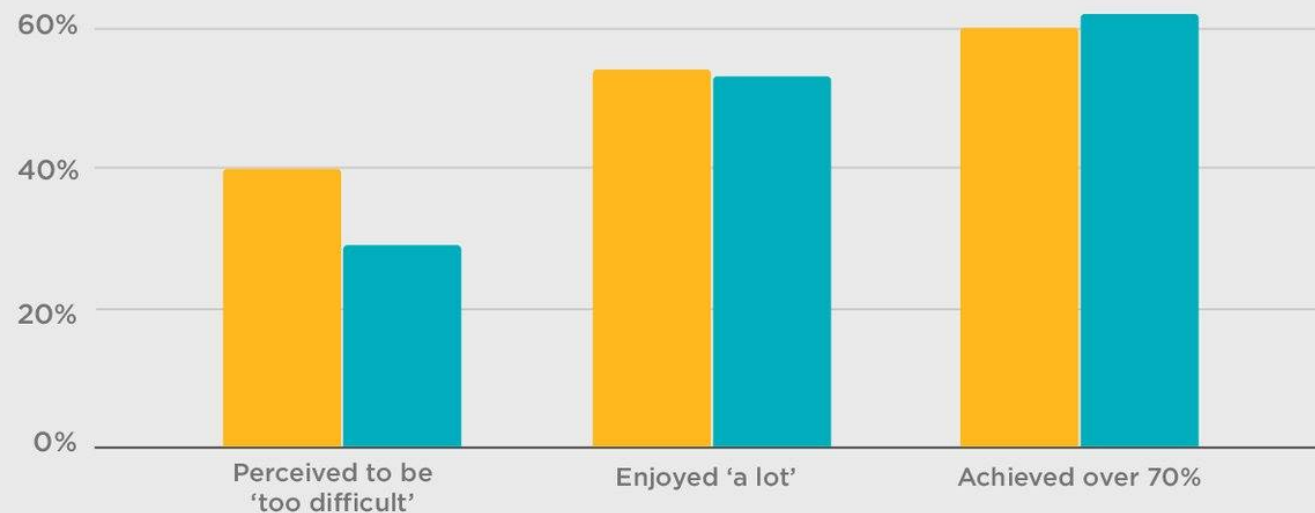
Alice Pritikin Steinglass ▶ CS Education discussion forum
14 hrs · 🌐

We were going through the student survey data and saw that females were 11% more likely to say that the programming units in our CS Principles course are too difficult for them. Yet, their scores on quizzes are in line with the males and they enjoyed the units roughly the same amount. Thought I'd share with this group - one more data point that sadly reinforces the gap between young women's confidence in their abilities and their success in CS. We need to keep encouraging these young women!

(Data from Code.org)

Teaching Do's and Don'ts

- DON'T: make anyone feel bad for the question they ask

- DON'T: say, "This is easy." (That's a **big** don't!)

- DON'T: tell someone that they should know something already

- DON'T: promote "defensive climate." Take advanced, off-topic questions offline. Don't pursue tangential topics in class that might make other students feel that they don't belong.

Teaching Do's and Don'ts

- DO: encourage questions in class
- DO: use gender-neutral pronouns (they/they're)
- DO: offer positive feedback and assurance of capability
- DO: be willing to help someone work through a concept, no matter your perception on where they should be in their understanding
- DO: Be honest in telling students that CS does not come easily to most people, even the most successful CS students

Activity 4: What can YOU do?

- Describe how you can implement at least two inclusive teaching strategies **in your own discussion section/lab/office hours** this term

Recap:

- Remove barriers to success:

  - Stereotype Threat
  - Implicit Bias
  - Impostor Syndrome
  - The Myth of 'Essential Differences'

- Keep thinking about the strategies that you might apply to increase equity and inclusion in all your teaching activities!

Take the final survey: bit.ly/CSEInclusiveGSI-Survey