CSE599: Teaching Methods in Computer Science

CSE 1202
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Expect Today...

- Working with real, live students
- Stereotyp threat / community / prior experience
- How to create an inclusive environment
- Practicum: more discussion presentations
Learning Goals: CSE 599

8. Explain the meaning of “stereotype threat” and be aware of possible biases.
9. Implement techniques for creating inclusive discussion groups.
Students (how we tend to see them)
Students (in real life)

Loves creating games

Heard CS pays well

Wants to impress faculty mother

Many different motivations
Students (in real life)

- Made the cover art for indy board game
- 700 Math SAT
- 800 Verbal SAT
- No computer at home
- Worked in IT in HS
- 780 Math SAT
- Dabbled in Programming
- 580 Math SAT
- No programming background
- Likes video games

Many different backgrounds
Students (in real life)

• Different motivations
• Different backgrounds
• Different cultures
• Different expectations
• Different strengths / weaknesses

*Get to know your students. It will improve your ability to teach them and connect with them.*
Students (in real life)

• Student emails you and wants an extension on an assignment

• Assumption: lazy or unorganized. Can't meet deadlines.

• May have family emergencies, medical challenges ...

  If you hear of this, bring it up with the instructor.

What can you do? Respect is key.
Take the time to learn more

- Different motivations
- Different backgrounds
- Different cultures
- Different expectations
- Different strengths / weaknesses

Get to know your students. It will improve your ability to teach them and connect with them.
Activity 1: we all struggle

- When have you struggled with something?
- Discuss factors that led to your struggling
Activity 2: belonging

• When was one time in your life where you felt out of place?
Stereotypes
Stereotype threat

"Stereotype threat refers to being at risk of confirming, as a self-characteristic, a negative stereotype about one’s social group" (Steele & Aronson, 1995)

- Women in math e.g. Spencer, Steele & Quinn 1999
- Whites vis a vis appearing racist e.g. Frantz et al 2004
- Students from low socioeconomic backgrounds when doing intellectual tasks e.g. Harrison et al 2006
- White men (compared with Asian men) in math e.g. Aronson et al. 1999
- Whites (compared with Blacks and Hispanics) when doing tasks assumed to reflect natural sports ability e.g. Stone 2002
Stereotype threat

Can cause self-defeating behavior

- increased stress in test situations
- defense mechanisms
  - Create a-priori excuses for failure
  - Attributing failure to their perceived group

Can change aspirations and goals

"Women math and science majors who viewed a discussion of math and science topics where males were numerically dominant showed lowered interest in participating in such future discussions" (Murphy et al 2007)

"The more that male characteristics were emphasized as important in a career field, the less women expressed an interest in entering that field" (Gupta & Bhave, 2007)
Prior experience

Why are most professional baseball players born in August-October?

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<th>Birth Month</th>
<th>American Major Leaguers</th>
<th>Foreign-Born Major Leaguers</th>
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<tr>
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Freakonomics and

http://www.slate.com/articles/sports/sports_nut/2008/04/the_boys_of_late_summer.html
Family / Community Support & Expectations

Story of a first-generation college student who fails her first exam.

Vanessa called home, looking for reassurance. Her mother had always been so supportive, but now she sounded doubtful about whether Vanessa was really qualified to succeed at an elite school like the University of Texas.

“Maybe you just weren’t meant to be there,” she said.

“Maybe we should have sent you to a junior college first.”

Support networks are key

Examples of successful role models who have struggled

http://www.nytimes.com/2014/05/18/magazine/who-gets-to-graduate.html?_r=1
Perspective on the field

What predicts success in STEM?

SAT score predicts success

** relative to the other students at your school **

The student who reaches to go to a better school may end up leaving their desired STEM field more often that if they'd gone to a "safety" school.

*Malcolm Gladwell. "David vs. Goliath Underdogs, Misfits, and the Art of Battling Giants*
Activity 2: bias

• Any surprises with the Implicit Bias study?
So what can I do?

Fixed vs. Growth Mindset (Dweck)

**Fixed mindset:** "natural ability or talent"

**Growth mindset:** "practice and/or hard work"

*Growth mindset interventions have been shown to improve outcomes*

- New science of **brain plasticity**: talent and giftedness are **dynamic** and can be developed.
- Importance and value of **challenge, effort, mistakes**
- Emphasize **process** in praise and feedback
Potential pitfalls

"So all of you guys did a great job on the last quiz!"

"For example, Bob and John both want to sort an array. Bob uses quicksort. John uses mergesort..."

"Debugging code can be about persevering. Tough debugging is like winning at Halo."

"Heterogeneous specialized processors allow you to select the right man for the job."

"For those of you who play Settlers of Catan, you know the frequency of dice rolls."

"John, that's a great question – really getting at the heart of this concept. Joan, thanks for asking that question, it's a really common misunderstanding."
Take-aways

Much of what we can view as "talent" may really be prior experience / practice.

Be careful not to perpetuate stereotypes.

Recognize stereotype threat when students exhibit it and try to help them better understand their abilities.

Support behaviors which foster learning rather than applauding existing knowledge.
Practicum

Wrap-up mini discussion presentations.

By the end of today, each person should have presented.

*Don't forget to record your group reflection at the end of the practicum session.*

*What do you plan to work on in your "live" discussion sections??*
Homework for Next Time

• Weekly: Check class website for assignment

• Assignments
  - Read first chapter of "How People Learn"
  - Post on Piazza about it

http://www.nap.edu/read/9853/chapter/1