Calculus Course Assistant Training

Inclusive Teaching

Department of Mathematics
Harvard University
Fall 2022

Why Our CAs are So Important

- Vast amount of valuable work that you do (e.g., providing feedback)
- Students are often more comfortable learning from their peers
- Serve as mentors/role models for new students considering concentrations/careers in math
- Set the tone and culture of the math department, and can impact the trajectory of a student's education and career

The Problem

The broader mathematics community, through implicit and explicit action (or inaction), has disproportionately excluded certain groups of people for many years, including women and ethnic minorities.

This has led to fewer people overall pursuing STEM careers, and a mathematical community that is not fully growing and benefiting from the diversity of ideas and experiences of these excluded groups.

This has also given the math community a negative reputation of exclusion, instead of a positive reputation of inclusion, collaboration, and joy.

National Statistics on Math/STEM Inclusivity

- % of White U.S. college students who declared a STEM concentration: **19%**
- % of Hispanic/Latino U.S. college students who declared a STEM concentration: **20%**
- % of Black U.S. college students who declared a STEM concentration: **18%**

- % of those White U.S. college students who completed a degree in STEM: **58%**
- % of those Hispanic/Latino U.S. college students who completed a degree in STEM: **43%**
- % of those Black U.S. college students who completed a degree in STEM: **34%**

Source: Riegle-Crumb, King, and Irizarry; American Educational Research Association, 2019

Statistics Closer to Home

- % of math concentrators at Harvard who are women: **20%**
- % of women who participated in math comps in H.S.: **76%** (vs. 80% of men)
- % of women who participated in math comps at Harvard: **7%** (vs. 28% of men)
- % of women who plan to attend grad school: **27%** (vs. 65% of men)
- % of women who plan to stay in academia: **18%** (vs. 47% of men)
- % of women who feel very uninvolved with the math dept: **45%** (vs. 12% of men)
- % of women math concentrators who decided not to take a math course because of “gender imbalances”: **26%**

Source: National Mathematics Survey, 2017

Comments and Quotes from the 2017 National Math Survey

Student-Student Interactions

- "You're good at math for a girl"
- “Sometimes people don't want to work with me because I'm a girl - the most common experience I have is explaining something to a male classmate, only to have him ask another male classmate to validate what I've said. UGH.”
- “One of my problem set partners mentioned that I should have an easy time finding a summer internship because I'm a girl”
- " ‘She does math AND is hot, it's crazy’; perpetuates the stereotype that to do maths (as a girl) you can't take care of your appearance (otherwise you must be dumb)."
- "I feel alone, increasing the pressure to do well to represent my gender"

Comments and Quotes from the 2017 National Math Survey

Faculty Interactions

- "Grad student indicated that he felt that there was no need to be concerned about the number of women in math or to try to encourage more women to take math. He also stated that he would not mentor a female student in the same way he would mentor a male student because she might falsely charge him with sexual harassment.

- “When I confided to a professor that I was having difficulty in his class because I didn't have a study group to work with in an almost exclusively male environment, his response was to tell me that if I wasn't able to keep up with the class, perhaps I should request a tutor or drop the course in favor of an easier one.”

- “Professor stated that women simply came in with less math preparation in high school, and that there was nothing the university could do to fix that. Professor insinuated that I might not be good enough at math to do a senior thesis, and that I should instead opt for a senior seminar…the only other people I have found who heard this from him seem to be women."

Comments and Quotes from the 2017 National Math Survey

Faculty Interactions

- "I've had a Math professor looking me up and down with surprise before talking to me and asking me if I'm sure I can handle maths research."

- “I didn't finish that pset last week.”
  “Of course, look who you were working with” (a group of girls)

- "A visiting professor walked through at office hours for my math class and commented how much more attractive girls in math were now than in his day."

The Good News...

- ALL of us have the power to improve the environment and culture in our department with small actions, *regardless of our identity or background*!

- ALL of us (including me!) can grow and become better at supporting our students!

Scenarios

Discussion Norms and Expectations

- **Use “I” statements whenever possible**
  - Speak from personal experience
  - Avoid broad, unsupported generalizations
- **Take Space, Make Space**
  - Let your voice be heard
  - Make space for others to be heard
- **Listen actively**
  - Let others finish their thought before speaking
  - Don’t just wait for your turn to talk
- **Avoid rushing to judgment/assume positive intent**

Scenario 1

Four students are working together on a proof in your office hours. Marie, the only female student in the group, suggests an idea for the proof, but no one in the group acknowledges or responds to her.

A few minutes later, Kevin (another student in the group), excitedly suggests the exact same proof idea that Marie suggested earlier. The other two boys in the group praise Kevin for coming up with the solution and proceed to write details. A minute later, Marie packs up her stuff and leaves the office hour without saying anything to anyone.

Scenario 1

Four students are working together on a proof in your office hours. Marie, the only female student in the group, suggests an idea for the proof, but no one in the group acknowledges or responds to her at all.

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Questions for discussion:

- How might Marie be feeling?
- As a CA, what action(s) should you take in the moment? What actions might you take later on?

Scenario 2

During one of your problem sessions, you are helping your students through a challenging p-set problem. Abdul, a student who you know has been struggling significantly in the course, asks a question out loud that you consider to be very basic. A couple of students in the back of the room start giggling at Abdul's question while sneaking glances at him.

Worried that answering Abdul's question might waste time for other students, you tell him that you'll address it with him later. Another student raises his hand and excitedly asks an advanced question that is beyond the scope of the course. Although you're able to answer it, you are unsure if you should in that moment.

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Our Core Beliefs

- ALL of our students should be treated with kindness, fairness, and respect, regardless of their identity or ability in math.

- We want ALL of our students to feel a sense of inclusion and belonging in our department.

- ALL of us have the ability and responsibility to help create a more inclusive environment for our students, *regardless of our identity or background.*

Small but Powerful Ways to Make Our Math Environment More Inclusive

- Get to know your students!
- Check in briefly with students who are struggling or have experienced exclusion
- Avoid exclusionary words, phrases, and actions
  - Excessive mathematical jargon (try to bridge their terminology with your own)
  - Words that trivialize their difficulties (“easy”, “obvious”, “trivial”, etc.)
  - Cutting a student off when you know what they’re saying/doing is incorrect
- Be aware of your own background, biases, and limitations
  - Body language
  - Who you prefer to work with/teach

Small but Powerful Ways to Make Our Math Environment More Inclusive

- Reach out to others for assistance and guidance on issues of equity and inclusion!
  - The Math Community Committee
    - Mike Hopkins, Department chair (mjh@math.harvard.edu)
    - Peter Kronheimer (kronheim@math.harvard.edu)
    - Hakim Walker (hjwalker@math.harvard.edu)
  - Veteran CAs
    - Jarell Cheong Tze Wen (jarellcheong@college.harvard.edu)
    - Dhruv Goel (gauravgoel@college.harvard.edu)
    - Eliot Hodges (eliothodges@college.harvard.edu)
    - Hahn Lheem (hahnlheem@college.harvard.edu)
    - Dora Woodruff (dorawoodruff@college.harvard.edu)