

Addressing the Impact of Implicit Bias on Teams in Introductory Engineering Courses

Laura Alford

Faculty Communities for Inclusive Teaching, 2016



NAVAL ARCHITECTURE & MARINE ENGINEERING
UNIVERSITY OF MICHIGAN

Project Overview

- Key Question:** How much does implicit bias affect students in introductory engineering courses (Engr 100 Intro to Engineering & Engr 101 Intro to Computer Programming)?
- Key Goal:** Determine whether or not implicit bias (or related topics) should be addressed in 100/101.
- Activities:** Four lunch meetings with faculty of 100/101 during Winter 2016
 - Review Fall 2015 student views on being “singled out.”
 - Read and discuss *Blindspot*; discuss reactions to taking Implicit Association Tests (IATs).
 - Discuss student views on implicit bias.
 - Plan how 100/101 might address implicit bias in the classroom.

Key Insights

- Our students are *a lot* more affected by implicit bias than we had realized. There were literally **hundreds of stories of students being singled out for how they looked or students having someone make assumptions about them based on how they look.**
- Equity and inclusion are directly impacted by implicit bias; all can impact a student’s ability to be an integrated member of a team.
- Taking implicit association tests (IATs) is an excellent first step towards recognizing implicit biases in ourselves before discussing how implicit bias affects other people.
- From group discussions, it became clear that any plan to address implicit bias, diversity, equity, and inclusion would need to be both easily adopted by 100/101 faculty *and* flexible as the faculty would need or want to do varying amounts of activities related to these topics.
- Because students are required to take both Engr 100 & 101, activities need to be complementary, to reduce direct repetition.

Participants

- Laura Alford, Naval Architecture & Marine Engineering
- Robin Fowler, Technical Communication
- Jamie Phillips, Electrical & Computer Engineering
- Elizabeth Hildinger, Technical Communication
- Lisa Grumble, Technical Communication
- Matt Johnson-Robertson, Naval Architecture & Marine Engineering
- Sonya Kotov, Computer Science & Engineering
- Peter Chen, Computer Science & Engineering
- Rob Sulewski, Technical Communication
- Rod Johnson, Technical Communication
- Walburga Zahn, Technical Communication
- Terisha Pinder-Grover, CRLT-Engin

Artifacts

At the final meeting of this group, we brainstormed activities that students could do to help them understand why equity and inclusion are so important to teamwork. We also discussed how these activities could be arranged throughout the semester and how they would complement each other in 100 vs. 101. The resulting plan (right) is one suggestion of how we might address implicit bias, equity, and inclusion in the introductory engineering courses.

Key:

- Required by any section participating (ideally, all 100/101 sections)
- Required if doing any activity other than entry/exit surveys
- Suggested activity, but not required
- Activity used for assessment

	Engineering 100	Section XXX is doing this (Y/N)	Engineering 101	Section XXX is doing this (Y/N)	Notes
Focus	Inclusion		Equity		
Entry Survey	5-7 base questions	Y	5-7 base questions	Y	questions will be the same across all sections; just have to insert into existing surveys that the sections use
First Day: Introduce Diversity, Equity, and Inclusion Initiative; state focus for the class	Diversity is the numbers in different groups Equity provides opportunities to everyone so they can succeed Inclusion welcomes everyone so they can succeed		Diversity is the numbers in different groups Equity provides opportunities to everyone so they can succeed Inclusion welcomes everyone so they can succeed		presentation material will be the same across all participating sections; CRLT could provide?
Early in semester (~3rd week): Implicit Association Tests (IATs)	Introduce concepts of roadblocks to inclusion: we naturally organize ourselves into social groups (e.g. gender, race/ethnicity, sexual identity, politics, religion, etc.); explain that we will explore how we view groups differently using one result of social groups -- implicit bias. Summarize the research behind the IAT. Take 2-3 IATs (NOT Gender-Science) Reflect on the IATs: Which IATs did you do? Check questions from F15-W16		Introduce concepts of roadblocks to equity: implicit bias, stereotype threat, imposter syndrome, “essential differences”; explain that we will learn about these using one set of social groupings -- gender. Summarize research showing gender inequity from these 4 roadblocks. Take Gender-Science IAT Reflect on the IATs: Check questions from F15-W16		forms for reflection will be the same across all sections; Laura & Robin can administer and process; minimal effort required by 100/101 faculty
Team/Group Contracts	Add a question on inclusion to the contract. Sample language: “When you see implicit bias in your colleagues, what will you do?” Add a question on inclusion within your team to the individual team assessment. Sample language: “Please also address how implicit bias affected your team because we know it was in your contract.”		Add a question on equity to the contract. Sample language: “When you see gender bias in your colleagues, what will you do?” Add a question on equity within your team to the individual group assessment. Sample language: “Please also address how gender bias affected your group because we know it was in your contract.”		individual 100/101 faculty will need to be responsible for gathering this data
Halfway through semester: First Person Experience Research	Provide a list of first person experiences of implicit bias; students pick 2: Videos TED Talks Essays Blog posts BuzzFeed articles Fair Play game Read Blindspot Reflect on the experiences: Which ones did you pick? Why? Other questions?		Provide a list of first person experiences of gender inequity; students pick 2: Videos TED Talks Essays Blog posts BuzzFeed articles Reflect on the experiences: Which ones did you pick? Why? Other questions?		100/101 faculty to collaborate on a list of resources, probably as a google doc that can be shared with the students; reflection form will be the same across all participating sections, will be administered by Laura & Robin, minimal effort by 100/101 faculty required
Near end of semester: Wrap-up talk in lecture/lab/ discussion	Revisit obstacles to inclusion; show some kind of results from the class’ activities; include strategies for dealing with implicit biases Reflect on this journey: Check questions from F15-W16		Revisit obstacles to equity (implicit bias, stereotype threat, imposter syndrome, “essential differences”); show some kind of results from the class’ activities; include strategies for dealing with gender bias Reflect on this journey: Check questions from F15-W16		source material can be common across all sections, or individual faculty can do different things; reflection form will be the same across all sections; will require at least 1 hour of class time
Exit Survey	5-7 base questions	Y	5-7 base questions	Y	Questions same across all sections; just have to insert into existing surveys sections used

Resources

- Blindspot: Hidden Biases of Good People*, Mahzarin R. Banaji & Anthony G. Greenwald, Delacorte Press.
- Google’s research on implicit bias, including training slides:
<https://rework.withgoogle.com/subjects/unbiasing/>
- Survey data from Engr 100/151, EECS 183/280 during the Fall 2015 semester (supported by the Computing CARES project). Survey data included student answers to:
 - Have you ever been singled out? If so, briefly explain.
 - Have you ever had someone assume something about you based solely on how you look? If so, briefly explain.
- The game Fair Play:
http://gamelearningociety.org/fairplay_micros/ite/
- Project Implicit: Implicit Association Tests:
<https://implicit.harvard.edu/implicit/takeatest.html>

Next Steps

This community represented a large part of 100/101, but not all faculty members.

This plan would need to first be discussed with the College of Engineering leadership for 100/101. It is critical that any plan be in line with the CoE’s own plan for the Diversity, Equity, and Inclusion Initiative.

After revision, this plan can be distributed to the entire 100/101 faculty. Faculty who can sign up to do as much or as little as they feel comfortable doing. There is value in all cases, as those that do not choose any of these activities can be control groups in future assessment, and other sections can try different amounts of these activities. Eventually, we may be able to target the most efficient activities.