

### **BRAID RESEARCH**



# **Reflections on Five Years of BRAID Research**

Dr. Linda Sax, Pl

#### Dr. Kate Lehman, Associate Director

#### Kari George, Sr. Data Manager

BRAID research is funded by: AnitaB.org, the National Science Foundation (NSF #1525737), the Computing Research Association, Facebook, Google, Microsoft, Intel, Qualcomm, Kapor Center and the Women of Color in Computing Collaborative, and Pivotal Ventures

### What is **BRAID**?



#### **Building Recruiting and Inclusion for Diversity**

- 15-campus initiative to promote gender and racial/ethnic diversity in undergraduate computing
- Partnership between AnitaB.org and Harvey Mudd College
- Research team at UCLA



**Commitment One:** Modify introductory CS courses to make them more appealing and less intimidating to underrepresented students.





**Commitment Two:** Lead outreach programs for high school teachers and students to build a diverse pipeline of students.



**Commitment Three:** Build confidence and community among underrepresented students.



**Commitment Four:** Develop and/or promote joint majors in areas like CS and biology that are attractive to underrepresented students.

### **BRAID Research Goals**



#### **Document the change process at BRAID Institutions**

- To what extent are BRAID schools successful in diversifying?
- What is the role of the department chair in leading diversity initiatives?

### Examine the experiences of computing students from underrepresented groups at BRAID schools

- What are introductory course students experiencing? What are the impacts of those experiences?
- What other computing environments and experiences predict gains in desired student outcomes in the years after taking the introductory course?

### Draw from other sources of data to further explore trends in diversifying computing

• Federal data on enrollment and degree attainment, nationwide surveys of first-year college students, etc.

### **BRAID Research Data Sources**







## The BRAID Research Top 10...



### 1. Draw from the wealth of diversity and inclusion knowledge available on your campus

### Draw from Resources On Campus



Utilize resources and knowledge of student affairs and diversity, equity, and inclusion offices

Arts & Sciences: "We are talking to the dean, we are trying to figure out ways that when the college creates materials and things, LGBT voices are represented" - Identity Center Staff



Computing: "I think of it much more as a developing collaboration, of people's attention being drawn to this now" - Identity Center Staff



# 2. Teach students how to work together

### The Key Role of Peer Support





Takeaway: Instructors should establish norms for group work



# 3.Take steps to ensure that naysayers do not impede progress

### **Redirect the Conversation**

"I think everyone understands the value of diversity, but not their role in how they might also be limiting our efforts...

So, we brought in somebody on implicit bias. She gave examples of classroom environments that flip that thinking. Faculty were like: Wow, I've never really thought about how I would feel in those situations!"

~ Dean

NSF now requires proposals to have a BPC, broadening participation component. I tell faculty: Hey, the Diversity Committee can provide you with numbers and ideas for this. Work with us and make your proposals more competitive!

~ Professor, Dept. of CS









### 4. Prioritize efforts that help everyone feel like they belong

# Building community with/out critical mass



"We have so few underrepresented students on campus...that means additional effort has to be put in place [to build peer support and community]" - CS Faculty

> "There are a lot of underrepresented students in the department ... [but] whenever I get the newsletter, from the CS department, they don't really talk about things that are relevant to underrepresented students, they just talk about the general stuff like this new research, job opportunities, and what different things are going on." - CS Student



# 5. Measure progress toward diversity in a variety of ways





# 6. Make it your practice to think intersectionally

# In 2018, how did the gender composition of computing majors vary by racial/ethnic group at BRAID institutions?



# In 2018, how did the racial/ethnic distribution of computing majors vary by gender at BRAID institutions?





### 7. Use intro courses to promote awareness of the broader computing field

### Intro Courses Can Inform Students About the Possibilities in Computing



Computing Students' Top Career Interests	
Men	Women
Software Developer/Programmer	Software Developer/Programmer
35%	32%
Computing-Related Entrepreneur	Computer/Information Analyst
10%	10%
Computer/Information Analyst	Management role in computing
9%	7%

Out of 60 possible career choices, 11 of which are explicitly computing-related, about 50% of computing students plan to pursue one of the above-listed careers.



### 8. Help students see themselves as computer scientists

### Why does it matter?

**Belonging in** computing and confidence in computing skills are strong predictors of major persistence, confidence in being admitted to CS grad program, and computing career aspirations.

**N** 

#### Who?

Women are less likely than men to feel they belong in computing, and report feeling even *less* like they belong by the end of CS1





#### What works?

Supportive departmental environments

Having reliable peer networks in computing classes

Articulating the wide applications of computing to all kinds of jobs and sectors



### 9. Care about non-majors

# The importance of non-majors in the computing pipeline





47% of survey participants enrolled in intro courses are <u>not</u> majoring in a computing field

#### Most Popular Non-CS Majors

32% Engineering

**18% Math and Statistics** 

**13% Social Sciences** 

**12% Biological Sciences** 

**11% Business** 



16% of latecomers indicated having a computing major or minor within a year of taking an intro computing course



**11%** of respondents who were not computing majors during the intro course expressed interested in a computing career two years later



### **10. Remember: CHANGE** TAKES TIME!

### Percent of Computing Majors at BRAID Institutions, by Gender\*URM Status (2014-2018)





### Tracking change over time using institutional data BRAID



# Shifting departmental culture and prioritizing diversity is a process



It's more because I don't want to bug them too much to the point that I turn them away. It's a slow kind of planting the seeds thing.

~ Computing faculty member

#### "

I think the awareness of [diversity issues] has ratcheted up... I think before, everybody thought, 'Yeah, we need to increase diversity,' but they didn't really know what to do.

~ Department Chair





Continue longitudinal follow-ups to track students through graduation and into careers



What's Next?

Analyze existing data and disseminate our work widely. Publish, publish, publish!



Expand the literature matrix resource to help others access research on broadening participation in computing



Collaborate with key partners on research as broadening participation work evolves

### **THANK YOU!**



