Gaining Insights Into The Effects Of Culturally Responsive Curriculum On Historically Underrepresented Students' Desire For Computer Science

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Equalizing Participation in Computer Science

1. A lack of presence of CS in K-12 education.
2. **The under-production of post-secondary degrees in CS**.
3. **The underrepresentation of women in CS**.
4. The underrepresentation of ethnic minorities in CS.
5. A lack of positive CS role models in the media.

Three pathways into CS at UC Berkeley

- **CS3: Introduction to Symbolic Programming** .
- CS61A: Structure and Interpretation of Computer Programs.
- CS61AS: Self paced version of CS61A

In her study of attrition in undergraduate CS
at Berkeley, Lewis found that female students
were disproportionately weeded out of the
track, often starting at CS3
Lewis:EECS-2010-132

Three pathways into CS at UC Berkeley

- **CS10: The Beauty and Joy of Computing**.
- CS61A: Structure and Interpretation of Computer Programs.
- CS61AS: Self paced version of CS61A

Dimensions Developed to Measure Participant's CS Interest

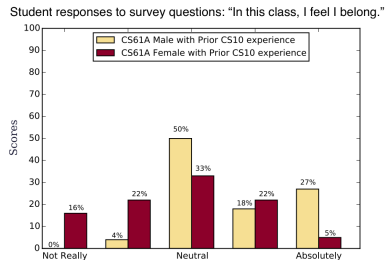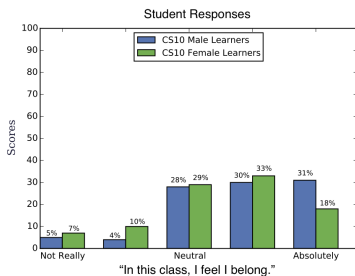| Code	Dimension
atcs	Attitudes about CS competency.
atcsgender	Attitudes about the role of gender in CS
atct	Understanding of computational thinking
blg	Sense of belonging in the CS classroom.
clet	Attitudes about social implications and ethics.
cltrcmp	Understanding around cultural competency.
mtr	Access to CS Mentors.
prcs	Pre-Collegiate CS awareness.

Table 0.1: Survey Instrument Dimensions to Measure CS Interest

Belonging

- Students generally had a stronger, statistically significant experience of belonging in CS10 as compared to CS61A.
- Important to notice that only around 50% of female learners had a positive sense of belonging ($p = 0.00104$) .
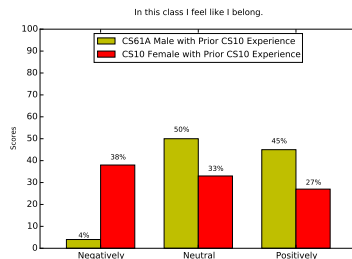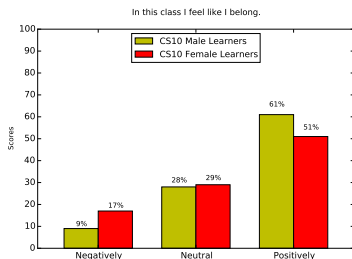
Effect of CS10 on CS61A Experience: Belonging

- students who had already taken CS10 seems to have a lower sense of belonging in CS61A, and in particular, female students, this effect seems magnified.

Effect of CS10 on CS61A Experience: Belonging

In this class I feel like I belong.

CS10 Male Learners
CS10 Female Learners

9%   17%   28%   29%   61%   51%

Negatively   Neutral   Positively

In this class I feel like I belong.

CS61A Male with Prior CS10 Experience
CS10 Female with Prior CS10 Experience

4%   38%   50%   33%   45%   27%

Negatively   Neutral   Positively

What impact does CS10 have in attracting female students into the major?

BLG_1: In this class, I feel I belong.

BLG_3: In this class, I feel like my ideas count.

BLG_4: In this class, I feel like I matter.

ATCS_3: I can achieve good grades (C or better) in computing courses.

ATCS_8: I am confident about my abilities with regards to CS.

ATCT_5: I know how to write computer programs.

ATCT_8: I know how to write a computer program to solve a problem.