California State University, Bakersfield Fab Lab: 'Making' a Difference in Middle School Students' STEM Attitudes

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## Worldwide Fab Network



# Methodology

- Who: approximately 120 area middle school students
- What: participate in a week-long summer program
- Where: CSUB Fab Lab
- How: training and activities on laser cutting, vinyl cutting, 3D printing, CNC router (Shopbot)
- Why: pre- and post- STEM Attitude Surveys (Friday Institute for Educational Innovation's Student Attitudes Toward Science, Technology, Engineering, and Mathematics, or S-STEM)

# Participants

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Selected	80
Eligible	49
Overall Male	32
Overall Female	17

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Selected	40
Eligible	31
Overall Male	14
Overall Female	17















## 2016 Results

#### Overall

- "Designing products or structures will be important in my future jobs." t(48) = -2.725, p < .05, d = 0.413<u>Males</u>
- "I feel good about myself when I do science." t(31) = -2.10, p < .05, d = 0.282
- "After I finish high school, I will use science often." t(31) = -3.30, p < .05, d = 0.485
- "When I'm older, I might choose a job that uses math." t(31) = -2.06, p < .05, d = 0.289
- "Designing products or structures will be important in my future jobs." t(31) = -2.701, p < .05, d = 0.569
- "I am good at building or fixing things." *t*(31) = -2.509, *p*<.05, *d* = 0.370 Females
- "In the future, I could do harder math problems." t(16) = -2.46, p < .05, d = 0.684

## 2017 Results

#### Overall

- "I am good at building or fixing things." t(30) = -2.108, p < .05, d = 0.310
- "I can work well with all students, even if they are different from me." t(30) = -2.476, p < .05, d = 0.451<u>Males</u>
- "When I'm older, I might choose a job that uses math." t(13) = -2.28, p < .05, d = 0.280<u>Females</u>
- "I know I can do well in science." t(16) = -2.40, p < .05, d = 0.484
- "Science will be important to me in my future career." t(16) = -3.77, p < .05, d = 0.531
- "In the future, I could do harder science work." t(15) = -3.09, p < .05, d = 0.888
- "In school and at home, I can do things well." t(16) = -2.219, p < .05, d = 0.409

### Discussion and Conclusion

- Male vs. Female; 2016 vs. 2017: What happened?
- Limitations
- Implications for future practice

