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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<thead>
<tr>
<th></th>
<th>2016</th>
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<th>2017</th>
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<tbody>
<tr>
<td></td>
<td>80</td>
<td></td>
<td>40</td>
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<tr>
<td>Eligible</td>
<td>49</td>
<td>Eligible</td>
<td>31</td>
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<td>Overall Male</td>
<td>32</td>
<td>Overall Male</td>
<td>14</td>
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<tr>
<td>Overall Female</td>
<td>17</td>
<td>Overall Female</td>
<td>17</td>
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2016 Results

Overall
• “Designing products or structures will be important in my future jobs.” $t(48) = -2.725, p < .05, d = 0.413$

Males
• “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.” $t(30) = -2.476, p < .05, d = 0.451$

Males
• “When I’m older, I might choose a job that uses math.” $t(13) = -2.28, p < .05, d = 0.280$

Females
• “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
Questions?