SMASH Impact Report 2017
There’s something to be said about being surrounded [at SMASH] by peers that are all competitive, goal driven, and hungry for more. There’s a drive in every person you meet. It’s infectious.

- SMASH Stanford Alumnus, University of California, Santa Cruz

WHY DIVERSIFY STEM EDUCATION?

Science, Technology, Engineering, and Math (STEM) occupations are in high demand and continue to be among the fastest growing and highest paying jobs in the US economy (BLS, 2017). STEM jobs grew twice as fast as the all other occupations between 2009 and 2015 (10.5% vs. 5.2%) and average wages for STEM occupations are nearly twice those of non-STEM occupations (BLS, 2017). Over 1 million new STEM job openings are projected to be created from 2014-2024 (BLS, 2017).

While STEM occupations are growing rapidly, Black and Latinx professionals are still sharply underrepresented in STEM fields. Although they comprise 30% of the US population (and growing), just 11% of science and engineering jobs are held by Black and Latinx workers (US Census, 2017 and NSF, 2017). Underrepresentation is even more stark in computing professions, where Black and Latinx workers combined hold just 9% of the technical positions in the tech workforce (Kapor Center, 2018). Increasing the representation of Black and Latinx STEM and computing professionals has the potential to meet the projected demand for STEM workers in the 21st century economy, while expanding opportunities for and broadening the economic opportunities of underrepresented communities of color.
SMASH: A TRANSFORMATIONAL MODEL

Through a comprehensive STEM program, the SMASH Academy impacts the educational and career trajectories of underrepresented high school students of color, transforming youth, families, and communities. The SMASH model includes:

- **3-year program**
- **Year-round academic courses and support**
- **Rigorous math, science, and computer science summer course sequence**
- **Alumni programming**
- **5-week summer residential program**
- **Longitudinal data collection and tracking**

**LOGIC MODEL**

The SMASH logic model outlines our approaches and short- and long-term outcomes the program aims to achieve.

**ACTIVITIES**
- STEM Classes
- College Application Prep
- Community Building
- Health & Wellness

**SHORT-TERM OUTCOMES**
- STEM-focused College Path Preparation
- STEM-focused College and Career Aspirations
- Peer and Adult Networks
- Sense of Positive Identity

**LONG-TERM OUTCOMES**
- Entrance to and persistence in STEM major & career
- Sense of belonging and connection to STEM community
- Sense of positive STEM identity
### SMASH SCHOLAR DATA

#### SMASH SCHOLARS AND ALUMNI BY SITE

<table>
<thead>
<tr>
<th>Site</th>
<th>Total Current Scholars</th>
<th>Total Alumni</th>
<th>Total Scholars + Alumni</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of CA, Berkeley</td>
<td>77</td>
<td>264</td>
<td>341</td>
</tr>
<tr>
<td>Stanford University</td>
<td>78</td>
<td>146</td>
<td>224</td>
</tr>
<tr>
<td>University of CA, Los Angeles</td>
<td>76</td>
<td>124¹</td>
<td>200</td>
</tr>
<tr>
<td>University of CA, Davis</td>
<td>59</td>
<td>-</td>
<td>59</td>
</tr>
<tr>
<td>Morehouse College</td>
<td>28</td>
<td>-</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total Students</strong></td>
<td><strong>318</strong></td>
<td><strong>534</strong></td>
<td><strong>852</strong></td>
</tr>
</tbody>
</table>

¹ Due to the closing of the University of Southern CA site and its subsequent transfer of scholars to University of California, Los Angeles, this alumni tally includes both sites.

² Summer 2017 was the second cycle of SMASH at University of CA, Davis, so there are no third year scholars or alumni.

³ Summer 2017 was the first cycle of SMASH at Morehouse College, so there are no second or third year scholars, or alumni.

### Demographics

#### Gender
- Male: 51%
- Female: 49%

#### Race/Ethnicity
- Latinx: 52%
- Southeast Asian: 8%
- Black/African-American: 32%
- Multiple ethnicities/other: 8%

#### Socioeconomic Status
- Free/reduced price lunch: 71%
- First generation college: 69%
- Average Household Income: $49,678
SMASH ACADEMY: 2017 OUTCOMES

The pre-post assessments examined program impact on scholars’ understanding of STEM content. Results showed the majority of scholars demonstrated significant growth in math, science, and computer science content knowledge from before SMASH to after SMASH.

% OF SCHOLARS WITH CONTENT KNOWLEDGE GROWTH

<table>
<thead>
<tr>
<th>Subject</th>
<th>Significant Growth</th>
<th>Overall Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math</td>
<td>66%</td>
<td>79%</td>
</tr>
<tr>
<td>Science</td>
<td>78%</td>
<td>87%</td>
</tr>
<tr>
<td>Computer Science</td>
<td>76%</td>
<td>94%</td>
</tr>
</tbody>
</table>

A. Participating in SMASH was the first time I saw myself reflected in my peers. It motivated me to go to college and to specific types of colleges. The positionality of SMASH and LPFI within the larger context of communities of color in general and people of color in STEM motivated me to pursue social justice endeavors.

- SMASH Berkeley Alumna, Stanford University

4 See Appendix for description of significant growth calculation.
The pre-post impact survey explored scholars' interest in pursuing STEM education and careers. Results demonstrated the majority of scholars intend to pursue STEM degrees and careers after high school.

92% of Smash scholars intend to major in STEM after Smash.

72% of Smash scholars intend to pursue a career in a STEM field after Smash.

The pre-post impact survey also measured the program's impact on key social-emotional indicators linked to STEM persistence. Results revealed scholars growth in overall self-efficacy and exposure to STEM careers and role models over the course of the program.

% of scholars with social-emotional growth

- Overall self-efficacy: 49%, 67%
- STEM career exploration: 42%, 52%

3 Scholars did not demonstrate significant growth in math or computer science engagement.
SMASH 2017 ALUMNI OUTCOMES

SMASH alumni high school graduation rates are 17% higher than the national average.

SMASH AVERAGE
100%

NATIONAL AVERAGE
83%

BLACK/LATINX AVERAGE
77%

SMASH alumni Bachelor's degree completion rates are 31% higher than the national average.

SMASH AVERAGE
91%

NATIONAL AVERAGE
60%

BLACK/LATINX AVERAGE
48%

SMASH alumni intend to major in STEM at a rate 31% higher than the national average.

SMASH AVERAGE
76%

NATIONAL AVERAGE
45%

BLACK/LATINX AVERAGE
43%

SMASH alumni complete STEM Bachelor's degrees at rates 2x higher than the national average.

SMASH AVERAGE
64%

NATIONAL AVERAGE
32%

BLACK/LATINX AVERAGE
31%

Most Frequently Attended Top 50:

Most frequently declared STEM majors:

Engineering | Biology/Human Biology
Computer Science | Psychology
Biomedical Sciences | Mathematics and Statistics

93% of our alumni move on to 4-year colleges, with 45% attending a US News & World Report Top 50 College/University.

70% of SMASH alumni major in STEM, and 23% are in computer and information sciences-related majors.

High school graduation, STEM major, and degree completion rates were calculated for both the national average overall and the national average for Black and Latinx students.
REPORT METHODOLOGY

The SMASH evaluation process and methodology were created to examine the outcomes and activities of the program (see page 2 for the SMASH program logic model) and measure the growth of scholar attitudes, aspirations, and academic knowledge over the course of the program. SMASH evaluation data have been collected each summer for seven years, along with annual alumni surveys to examine longitudinal outcomes of SMASH scholars. The data and findings are subsequently used to inform program planning and development.

Data Collection

The SMASH impact evaluation included three forms of data collection: (1) Academic assessments examining growth in mathematics, science, and computer science knowledge, (2) SMASH scholar impact survey examining students’ attitudes and aspirations, (3) SMASH alumni survey tracking post-secondary data of SMASH alumni. Scholar data were collected at both pre- and post-SMASH program and alumni data were collected annually.

Analytical Procedures

For SMASH impact data, statistical significance levels for scholars were calculated using effect size benchmarking (a way of quantifying the size of a difference between two means after identifying that there is a statistically significant difference between the scores pre-program and post-program). Descriptive statistics were used for the alumni data.

For additional detailed information of survey instruments and analytical procedures, please contact research@kaporcenter.org.