SAGE-ACE-OC STEM Summer Bridge Program

Summer 2012

Project ASCENCION
Oxnard College’s Title V STEM grant

Evaluation Report – 9/10/12

Submitted to
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Prepared by
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Executive Summary

Project “ASCENSION” Oxnard College set as one of its goals to continue to establish an early readiness awareness framework for STEM degrees and increase the number of underrepresented students entering community colleges and successfully transferring into 4-year institutions.

Under Project “ASCENSION”, an eight-day summer bridge program (over the course of 2 weeks) was tailored to the student population of the Oxnard Union High School District (OUHSD) ACE (Architecture, Construction & Engineering) Charter School. The summer bridge program aimed to expose students to hands-on project-based learning crossing the areas of mathematics, engineering, public administration, urban and GREEN planning, and financing. Furthermore, it aimed to increase students’ awareness to a variety of educational and career pathways. To achieve these aims, the bridge curriculum included classroom activities, educational excursions, and meetings with industry professionals and leaders, all within a college setting. Accordingly, the themes and activities of the program were as follows:

Week 1 Theme: Exposure to the challenges and opportunities presented to urban planners.
Week 2 Theme: Exposure to the challenges and opportunities presented to those in the “house flipping” business.

Activities included designing the construction of a parcel of property in Oxnard and building a 3D model while taking into consideration materials and costs, meetings with professionals (including an urban planner, the owner and manager of a well established construction company in Ventura County, a landscaper, the GREEN building program advisor for the City of Santa Monica, and a person in the business of flipping houses), and taking educational excursions to tour GREEN buildings in Santa Monica and house flipping renovation work in Ventura County.

Concentrating on both program outcomes and implementation of the program, the evaluation contained many components and perspectives. Results indicated that the program successfully exposed students to multiple aspects of the engineering construction field and the large variety
of educational and career pathways available to them. Specifically, data analyses revealed the following outcomes:

- Increased awareness to a variety of academic and career pathways.
- Increased understanding of the engineering construction field and its components.
- Increased interest in STEM.

Overall, students and professors had a very positive perception of the program—its implementation and operation.

Concerned with the development of summer bridge exemplary prototypes, the program was further evaluated for its feasibility of replication across settings and partnerships. With minor adjustments, this program has good potential for replication. Lessons learned include scheduling the program to initiate immediately following the end of the school year (to address the low turnout rate of participants), and further developing the integration of mathematical concepts and applications into project-based classroom learning.
Under Oxnard College’s Title V STEM grant (“Project ASCENCION”) and in cooperation with the SAGE foundation, an eight-day summer bridge program was delivered to Oxnard Union High School District (OUHSD) ACE Charter School’s students. The program focused on providing students with opportunities to experience project-based classroom learning within a college setting in the engineering construction field, particularly, urban architectural design and GREEN projects.

**STUDENTS’ CHARACTERISTICS**

- All students, but one, belonged to the ACE charter school. Students’ grade level varied as follows: 2 students were incoming 10th graders, 2 students were incoming 11th graders, 5 students were incoming 12th graders, and one student had just graduated high school. One additional student, an incoming 9th grader, is homeschooled by his parents.
- The ACE Charter School serves a heterogeneous group of students, including students from different familial backgrounds and surrounding neighborhoods, as well as students with varying degrees of engineering knowledge, and educational and career aspirations.
- Students were selected to participate in the program by school professionals based on an application process facilitated by the STEM center at Oxnard College.
- Students’ previous experience with computers and specifically Google sketch was recommended for successful participation in the program.

**PROGRAM GOALS**

Centered at Oxnard College and facilitated by two of the college’s distinguished professors—Marlene Dean from the Math Department and Christiane Mainzer from the Science Department—the program aimed to achieve the following five goals:

1. Students experience engineering construction through project-based work.
2. Students develop awareness to a variety of academic and career pathways.
3. Increase in students’ educational and career aspirations.
4. Students develop their understanding of the “bigger picture” of engineering construction and the various components it entails.

5. Increase in students’ motivation to develop an educational pathway and/or career plan.

6. Increased interest in STEM.

Appendix A presents the program’s resources, activities and outputs as they relate to the program’s outcomes.

**CURRICULUM**

Working in groups of 2-3 members, students were asked to plan and execute (by building a 3-D model) an engineering construction design for a vacant lot in Oxnard. Activities were planned to address different aspects of an engineering construction design including, but not limited to, considering usage/purpose, taking measures, choosing materials and techniques, calculating costs and planning budget. The learning of the students was further stimulated through meetings with industry professionals (for example, an urban planner, landscaper, the GREEN building program advisor for the City of Santa Monica) and hearing about their educational and career pathways, as well as going on two educational excursions - to see GREEN projects in Santa Monica and to see the filliping of houses in Ventura County. Groups had the opportunity to present their designs and demonstrate their learning to a panel of distinguished judges (some of which the students have met during the course of their two-week activity) including, among others, the EVP of Oxnard College, director of the STEM grant, owner and manager of a distinguished construction company in Ventura County. This celebration event took place on the last day of the program; students’ families were invited to participate.

**Evaluation**

**PROTOCOL**

The aim of the evaluation was twofold: (a) to measure program outcomes with respect to pre-declared goals; (b) to provide insight into program implementation and its operation.

Accordingly, several surveys were administered as follows:
Program Helped Develop Awareness of ... (N=11)

- Disagree
- Somewhat Disagree
- Neutral
- Somewhat Agree
- Agree

Additional evidence to the increase in students’ awareness for the pathways available to them may be found in their responses to a question asking them about the kind of job they would like to have in 10 years. Four students indicated having an idea for their desired job at the
beginning of the program (pre survey); and according to the post survey, three additional students were able to indicate a desired job at the end of the program. These included the following jobs: environmental engineer, contractor/engineer, and architect/engineer.

Finally, reflecting on their experiences with the educational excursions and guest speakers, most students indicated that both the excursions and the meetings with professionals from the industry greatly prompted their thinking about their plans for the future. The following table presents their responses.

<table>
<thead>
<tr>
<th>The following prompted my thinking about my plans for the future</th>
<th>Green Buildings in Santa Monica</th>
<th>Flipping of houses in Ventura County</th>
<th>Meeting people from the industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Somewhat disagree</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Neutral</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Somewhat agree</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Agree</td>
<td>6</td>
<td>5</td>
<td>7</td>
</tr>
</tbody>
</table>

**INCREASED EDUCATIONAL AND CAREER ASPIRATIONS**

The program had a positive effect on students’ aspirations: Most students noted that they may, as a result of their participation in the program, consider pursuing higher educational and career goals than what they previously had in mind.

**Student May Consider a Higher ... (N=11)**

[Diagram showing distribution of responses]
INCREASED UNDERSTANDING OF THE ENGINEERING CONSTRUCTION FIELD AND ITS COMPONENTS

Through meetings with industry professionals and going on educational excursions, students had the opportunities to expand their understanding of the many and diverse aspects encompassed under the engineering construction field. Findings indicated that the program had a meaningful effect on students' understanding of the field. These results are presented in the following graph:

In addition, \( n=10 \) students (91%) agreed, to some extent, with the following statement: “The field trip to see Green Buildings in Santa Monica enhanced my understanding of the various jobs that exist in the engineering construction field”; and, \( n=9 \) students (82%) agreed with the same statement when were asked about their experience with the flipping of houses educational excursion. Moreover, students (\( n=10, \) 91%) found the encounters with the industry professionals to also be beneficial to them in this domain. Results are presented in the following graph.
INCREASED INTEREST AND MOTIVATION IN STEM

In the pre/post survey, students were asked about their interest in STEM. Most of the students ($n=9$) indicated an interest in at least one of the subjects included under the STEM field, while $n=2$ students were uncertain of their interest. By the end of the program, the interest of these two students in STEM was formed. All students indicated an interest in STEM in their post survey responses.

Furthermore, at the end of the program, all students ($n=1$ was missing) noted that their interest in at least one of the STEM disciplines increased as a result of participating in the program.
PROGRAM IMPLEMENTATION AND OPERATION: ANALYSES AND RESULT

STUDENTS’ PERSPECTIVES

CURRICULUM

Program curriculum was perceived by the students to be highly relevant to their academic development.

Program was Relevant to the Academic Development of the Student (N=11)

Furthermore, infused with project-based activities, educational excursions and the meetings of professionals from the industry, the program helped students envision themselves continuing their education beyond high school as well as their future as professionals.

The Program Helped the Student Envision His/ Her ... (N=11)
STUDENTS’ SATISFACTION WITH THE EDUCATIONAL EXCURSIONS AND GUEST SPEAKERS

Students were asked to reflect on their educational excursions, particularly, the extent to which the trip was valuable, interesting, well organized, and should be kept in the program for next year. A similar question was also presented to them related to their experience with the professionals for the industry. Students’ high satisfactions with each component are displayed in the following graphs. Their satisfaction with the educational excursions also was stated in their responses to one of the open-ended questions. Specifically, all students listed the educational excursions as one of their top three favorite activities.
LENGTH OF THE PROGRAM
Most of the students (64%) thought the length of the program (i.e., eight days) was “just right”, while 36% of the students found it to be too long.

STUDENTS’ OVERALL SATISFACTION WITH THE PROGRAM
Students were highly satisfied with the program. When presented with a 5-point scale, all of the students agreed with the following statements:

I. “The program should run again next year, for the benefit of other ACE students”
II. “I would recommend other students to participate in the program”

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Professors’ Perspectives</strong></td>
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<tr>
<td>Professors were asked to reflect on several topics, including but not limited to, the curriculum, educational excursions, and the goals of the programs. Their responses to the end-of-the-program survey proved insightful and valuable as detailed in the next sections.</td>
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<tr>
<td><strong>Curriculum</strong></td>
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<tr>
<td>Professors felt that the curriculum was appropriate, but that the delivery of the curriculum should be altered. Specifically, it was identified that activities should be broken into smaller segments as it was challenging for students to approach a big project. Providing students with some more guidance/ modeling may also serve to mitigate the challenge.</td>
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</table>
EDUCATIONAL EXCURSIONS

- GREEN construction in Santa Monica – professors perceived the excursion to be highly successful for the following reasons:
  - The city of Santa Monica is committed to GREEN construction and sustainability of the environment in urban landscaping, and thus directly links to the curriculum of the program.
  - The tour guide was very patient and knowledgeable.
  - For many students this was a first opportunity to visit the city.

- Flipping houses in Ventura County –
  - The objective of the excursion was to expose students to important aspects of consideration when “house flipping” with the purpose of increasing the value of the property. These considerations include, for example, project planning and budgeting, and return-on-investment. The learning was critical given the nature of the project assigned to the students (i.e., planning and designing a construction project).
  - Based on this year’s experience, the professors advised that this tour be scheduled after students had the opportunity to work on related activities in the classroom and have had some preparation modeling their project.

PROGRAM’S GOALS

Professors felt the goals for the program were met, especially having students develop awareness of the different educational and academic pathways available to them.

PROGRAM’S STRENGTHS

The main strength of the program was recognized by the professors as the “experimental learning” opportunity the students were exposed to and its connections to their educational experiences and planning for their futures. Furthermore, students were exposed to different career pathways via invaluable meetings with professionals working in various jobs in the industry. It was through these meetings that students had the opportunities to learn from
experienced and successful others and be inspired by them to work hard, produce a quality of work, demonstrate high motivation, and show perseverance in the presence of difficulties, to name a few.

**OPERATION**

According to the professors, the program ran efficiently. However, it was recommended to consider scheduling the program to start earlier in the summer as it may result in a higher turnout rate. Moreover, professors mentioned the challenge involved in balancing between sophomore and senior participants and advised the program to recruit incoming 11th and 12th graders only, as some of the performance demands were too high on the younger students. Furthermore, it was recommended by the professors that snack time be integrated into the schedule and that lunches provided by the program include pizza less frequently.

**REPLICATION OF THE PROGRAM**

The structure of the program—project-based learning infused with meetings with professionals and industry leaders and educational excursions—proved beneficial. Through hands-on experiences, students learned to apply, and the utility of, theoretical academic concepts such as mathematics, engineering, and finance, and the personal stories of inspiring professionals helped bring meaning to the students’ educational endeavors. Thus, this format of the summer bridge program may be successfully replicated across fields of interest. Furthermore, the complete developed program (form and content) also has the potential of being replicated across schools and groups of students. However, as noted by the professors, the program takes advantage of students’ familiarity with “Google Sketch” and “Power Point”. This skill set may not be sufficiently developed among other students (*evaluator note*: perhaps the program can be adjusted to accommodate students with no such prior knowledge).

**EVALUATION: LESSONS LEARNED**

1. Some of the questions in the pre/post survey, while made sense in the developing stage of the survey, did not provide insight. Consider revising the survey for next year.
2. Working closely with the professors prior to the beginning of the program on the development of the evaluation component and tailoring the evaluation to the specific program goals and operation had an extremely high value.

3. Administration of end-of-program survey to professors proved to be very important and valuable. Their input can be directly integrated into next years’ programs.

4. As planning and implementation may change during the course of the program, it is very important for the evaluator to keep informed with developments and revisions in the program plan, and update the evaluation materials accordingly.

**Conclusions and Recommendations**

Targeted at students coming from Oxnard Union High School District (OUHSD) ACE (Architecture, Construction & Engineering) Charter School, the ACE-SAGE-OC STEM summer bridge program focused on building a bridge between students’ classroom-learning and post-graduation educational and career pathways. To achieve this goal the program was based at Oxnard College and the curriculum was founded on three complementing components: project-based classroom learning, educational excursions, and inspirational meetings with professionals and industry leaders.

Data collected demonstrated that the program achieved its pre-defined goals. More specifically, analyses revealed increases in students’ educational and career aspirations and in their awareness to a variety of STEM pathways. Increased interest in STEM was also evident. These outcomes, in turn, may increase the likelihood of students’ making more informed educational decisions, attending college, majoring in STEM and obtaining a college degree within a shorter period of time.

Students and professors’ reflections on the operation of the program indicated that the program was well planned and properly delivered. The professors were able to indicate points for improvement, mainly in offering students with more activity scaffolding. It is also
recommended to schedule the program immediately following the end of the school year since families often travel during the later weeks of the summer break. Nevertheless, since the program was very successful serving a small number of students perhaps it would be worthwhile reconsidering the desired group size.

Considering the successful implementation and most favorable outcomes of the program, it is recommended that the program run again next summer. The effective format of the program—integrating hands-on learning activities, educational excursions, and meetings with professionals—may serve as a guide to other educational agencies and partnerships in developing summer bridge programs. The program in its current curriculum (i.e., content) may also be successfully replicated across settings and populations, though it is advised to think about the framing of the program when targeting schools that have less emphasis on engineering construction, as well as the revising of the curriculum to successfully accommodate for students with no prior experience with the Google Sketch tool.
**Appendix A: Theory of Action**

<table>
<thead>
<tr>
<th>Resources</th>
<th>Activities</th>
<th>Outputs</th>
<th>Short-term Outcomes</th>
<th>Medium-term Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant money</td>
<td>8-day curriculum</td>
<td>Students get exposure to the wide range of jobs the engineering construction field entails and the interdisciplinary of the field.</td>
<td>Increase in students’ awareness of potential educational pathways and careers</td>
<td>Increase in the number of students who pursue STEM CTE (College for Technical Education) or academic pathways at a college</td>
</tr>
<tr>
<td>SAGE money</td>
<td>Students working in teams to create their engineering construction plan for a given area</td>
<td>Students get hands-on exposure to the STEM fields</td>
<td>Increase in students’ motivation to develop a plan for educational and/or career pathways</td>
<td>Increase in the number of students who major in STEM</td>
</tr>
<tr>
<td>OC classrooms</td>
<td>Expose students to the bigger picture of architectural design, GREEN projects and urban planning</td>
<td>Students get exposure to their surrounding area and advancement in architectural design, GREEN projects and urban planning in their area</td>
<td>Increase students’ educational and career aspirations</td>
<td></td>
</tr>
<tr>
<td>2 OC professors (Marlene and Chris)</td>
<td>Facilitate students’ hands-on experience with different materials and green technology</td>
<td>Students engage in activities and participate in presentation that promote familiarity with STEM educational and occupational opportunities beyond HS</td>
<td>Increased interest in STEM</td>
<td></td>
</tr>
<tr>
<td>Presenters from the Industry</td>
<td>Field trip to green buildings in Santa Monica</td>
<td>Students are more committed to their education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant administrators</td>
<td>Field trip to flipping houses sites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACE students</td>
<td>Presentations provided by people from the industry</td>
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<td>Materials (including laptops, Google Cad, and cameras)</td>
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<tr>
<td>Transportation to field trips</td>
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<tr>
<td>Lunches</td>
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</tbody>
</table>
Appendix B

SAGE-ACE-OC STEM Summer Bridge Program, 2012 - Entrance Survey
This survey will be strictly confidential

Name:_______________________________ School:______________________________

1. The STEM field includes the following subjects: Science, Technology, Engineering, and Math.
   Do you agree with the following statement:
   “I have an interest in at least one of the subjects included under the STEM field”
   □ Yes
   □ Not Sure
   □ No

2. Do you know what having an educational pathway plan means?
   □ Yes (go to question 3)
   □ Not Sure (go to question 5)
   □ No (go to question 5)

3. Do you have an educational pathway plan?
   □ Yes
   □ Not Sure
   □ No

4. Do you agree with the following statement:
   “There are many different educational pathways a person like me can take”
   □ Yes
   □ Not Sure
   □ No

5. Do you know what having an occupational/career pathway plan means?
   □ Yes (go to question 6)
   □ Not Sure (go to question 8)
   □ No (go to question 8)

6. Do you have an occupational/career pathway plan?
   □ Yes
   □ Not Sure
   □ No
7. Do you agree with the following statement:
   “There are many different occupational/career pathways a person like me can take”
   □ Yes
   □ Not Sure
   □ No

8. Do you agree with the following statement:
   “I can see the value of college education”
   □ Yes
   □ Not Sure
   □ No

9. As things stand now, how far in school do you hope you will get?
   □ Less than high school graduation
   □ GED or other equivalency only
   □ High school graduation only
   □ Attend or complete a 1- or 2-year program in a community college or vocational school
   □ Attend college, but not complete a 4- or 5-year degree
   □ Graduate from college (4- or 5-year degree)
   □ Obtain a Master’s degree or equivalent
   □ Obtain a Ph.D., M.D., or other advanced degree
   □ Don’t know

10. What kind of job would you like to have 10 years from today?
    □ I don’t know (Thank you, you have completed the survey)
    □ I would like my job ten years from now to be: ____________________________________________
        ____________________________________________________________ (go to question 11)

11. Do you have a plan on how to achieve your employment goal (i.e., obtaining a specific job 10 years from now)?
    □ I know what kind of job I would like to have, but I don’t have a plan on how to get there
    □ Yes. I have a plan. Here is a brief summary of my plan: ________________________________
        ________________________________
        ________________________________
Appendix C

**SAGE-ACE-OC STEM Summer Bridge Program, 2012 – End of the Program Survey**

We would like to hear about your overall experiences with the summer bridge program. Your answers will assist us in making improvements in the program for next year.

**Field Trips**

The following questions refer to the field trips to see Green Building in Santa Monica and Flipping houses in Ventura County

Please indicate the extent to which you agree or disagree with each statement using the following scale, ranging between 1=disagree to 5=agree

<table>
<thead>
<tr>
<th>Statement</th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The field trip to see Green Buildings in Santa Monica ...</strong></td>
<td></td>
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<tr>
<td>was valuable for me</td>
<td>1 2 3 4 5</td>
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<tr>
<td>was interesting</td>
<td>1 2 3 4 5</td>
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<tr>
<td>Enhanced my understanding of the various jobs that exist in the</td>
<td>1 2 3 4 5</td>
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<td></td>
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<tr>
<td>engineering construction field</td>
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<tr>
<td>prompted my thinking about my plans for the future</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>was well organized</td>
<td>1 2 3 4 5</td>
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<tr>
<td>should be kept in the program for next year</td>
<td>1 2 3 4 5</td>
<td></td>
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<tr>
<td><strong>The field trip to see the flipping of houses in Ventura County...</strong></td>
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<tr>
<td>was valuable for me</td>
<td>1 2 3 4 5</td>
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<tr>
<td>was interesting</td>
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<td>Enhanced my understanding of the various jobs that exist in the</td>
<td>1 2 3 4 5</td>
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<tr>
<td>engineering construction field</td>
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<td>prompted my thinking about my plans for the future</td>
<td>1 2 3 4 5</td>
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<td>was well organized</td>
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<tr>
<td>should be kept in the program for next year</td>
<td>1 2 3 4 5</td>
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</tbody>
</table>
Meeting people from the industry

In the course of the program you had the opportunity to meet with several industry people. These people shared with you their stories about their education and career paths.

The following questions refer to the program’s guests speakers, in general. Please indicate the extent to which you agree or disagree with each statement using the following scale, ranging between 1=disagree to 5=agree

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
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<tr>
<td>Meeting people from the industry and hearing about their</td>
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<td>education and career paths...</td>
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<tr>
<td>was valuable for me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>was interesting</td>
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<td>2</td>
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<td>5</td>
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<td>Enhanced my understanding of the various jobs that exist in</td>
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<td>2</td>
<td>3</td>
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<td>5</td>
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<tr>
<td>the engineering construction field</td>
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<tr>
<td>prompted my thinking about my plans for the future</td>
<td>1</td>
<td>2</td>
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<tr>
<td>should be kept in the program for next year</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</table>

General

Here are some additional general questions about the summer bridge program. Please indicate the extent to which you agree or disagree with each statement using the following scale, ranging between 1=disagree to 5=agree

<table>
<thead>
<tr>
<th></th>
<th>Disagree</th>
<th>Somewhat Disagree</th>
<th>Neutral</th>
<th>Somewhat Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a result of participating in the program...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have developed awareness of the different educational</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>pathways available to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have developed awareness of the different career pathways</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>available to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I better understand the various components the engineering</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>construction field is comprised off</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My interest in at least one of the STEM disciplines (i.e.,</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Science, Technology, Engineering, Math) has increased</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I may consider pursuing a higher educational goal than I</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>previously had in mind</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I may consider pursuing a higher **career goal** than I previously had in mind

<table>
<thead>
<tr>
<th>I may consider pursuing a higher career goal than I previously had in mind</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Somewhat Disagree</td>
<td>Neutral</td>
<td>Somewhat Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

The program should run again next year, for the benefit of other ACE students

<table>
<thead>
<tr>
<th>The program should run again next year, for the benefit of other ACE students</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Somewhat Disagree</td>
<td>Neutral</td>
<td>Somewhat Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

I would recommend other students to participate in the program

<table>
<thead>
<tr>
<th>I would recommend other students to participate in the program</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Somewhat Disagree</td>
<td>Neutral</td>
<td>Somewhat Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

The program was relevant to my development as a student

<table>
<thead>
<tr>
<th>The program was relevant to my development as a student</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Somewhat Disagree</td>
<td>Neutral</td>
<td>Somewhat Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

The program helped me envision myself continuing my education beyond high school

<table>
<thead>
<tr>
<th>The program helped me envision myself continuing my education beyond high school</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Somewhat Disagree</td>
<td>Neutral</td>
<td>Somewhat Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

The program helped me envision myself as a professional in the future

<table>
<thead>
<tr>
<th>The program helped me envision myself as a professional in the future</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Disagree</td>
<td>Somewhat Disagree</td>
<td>Neutral</td>
<td>Somewhat Agree</td>
<td>Agree</td>
</tr>
</tbody>
</table>

The length of the program (i.e., 8 days) was *(please choose one answer choice)*

- [ ] Too long
- [ ] Just right
- [ ] Too short

Please list (in a descending order) the 3 things you liked best about the program

(1) _____________________________________________________________________________

(2) _____________________________________________________________________________

(3) _____________________________________________________________________________

Please suggest ways in which the program and its activities (including the field trips and guests from the industry) may be changed for the better *(list as many as possible)*

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________

If you have any additional thoughts, suggestions, or comments, about the summer bridge program, please share them with us

_____________________________________________________________________________________

_____________________________________________________________________________________

_____________________________________________________________________________________
Appendix D

Professor’s name: ___________________

SAGE-ACE-OC STEM Summer Bridge Program, 2012 – End of the Program Professor Survey

We would like to hear about your overall experiences with the summer bridge program. Your answers will assist us in making improvements in the program for next year.

If you need more space, please also use the other side of the page or attach an additional paper.

1. Based on your experience, do you think the curriculum of the program (e.g., content, level, depth) should be revised? In what ways?
   ____________________________________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

2. Can the operation of the program be improved (e.g., location and rooms, equipment/materials, lunches, transportation, program’s length and hours)? In what ways?
   ____________________________________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________

3. The program included two educational excursions. Please capture your main insights, lessons learned, and tips for a successful trip to each of the locations (you may also refer to the guest speakers at each location, if applicable)

   Green Building in Santa Monica
   ____________________________________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________
   ____________________________________________________________________________________
4. In your opinion, what are the strengths of the programs? (i.e., what makes the program valuable?)

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

5. The program aimed to achieve several goals (listed below). Using a scale ranging from 0=Goal was not met at all to 100=Goal was fully met, please indicate the extent to which each of the goals was met

<table>
<thead>
<tr>
<th>Goal</th>
<th>0-100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students develop awareness of the different academic and career pathways available to them</td>
<td></td>
</tr>
<tr>
<td>Increase in students’ educational and career aspirations</td>
<td></td>
</tr>
<tr>
<td>Increase in students’ motivation to develop an educational pathway and/or career plan</td>
<td></td>
</tr>
<tr>
<td>Increased interest in STEM</td>
<td></td>
</tr>
</tbody>
</table>

6. In hindsight, do you think goals should have been defined differently (perhaps some goals should be added and others revised)?

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

7. In your opinion, can the project be effectively replicated? What are the critical implementation elements? How might contextual factors (e.g., the fact that student participants came from the same school, students’ backgrounds, the environment) impact replication?

__________________________________________________________________________________
__________________________________________________________________________________
8. Please share any feedback you may have on the evaluation component of the program

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

9. If you have any additional thoughts, suggestions, or comments, about the summer bridge program (e.g., the knowledge level and personality of the students, the team of instructors), please share them with us

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Thank you 😊
Appendix E

SAGE-ACE-OC STEM Summer Bridge – Evaluation Plan

Program Goals:
1. Students develop awareness of the different academic and career pathways available to them
2. Increase in students’ educational and career aspirations
3. Students develop their understanding of the “bigger picture” of engineering construction and the various components it may entail.
4. Increase in students’ motivation to develop an educational pathway and/or career plan
5. Increased interest in STEM

<table>
<thead>
<tr>
<th>Measures</th>
<th>Instrument</th>
<th>Administration time</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students educational awareness and aspirations</td>
<td>Pre-survey</td>
<td>7/23 (early morning)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-survey</td>
<td>8/2 (noon)</td>
<td></td>
</tr>
<tr>
<td>Students career awareness and aspirations</td>
<td>Pre-survey</td>
<td>7/23 (early morning)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-survey</td>
<td>8/2 (noon)</td>
<td></td>
</tr>
<tr>
<td>Students’ STEM interest</td>
<td>Pre-survey</td>
<td>7/23 (early morning)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-survey</td>
<td>8/2 (noon)</td>
<td></td>
</tr>
<tr>
<td>Program’s operation overall – Participant’s perception</td>
<td>End of the program survey</td>
<td>8/2 (noon)</td>
<td></td>
</tr>
<tr>
<td>Program’s operation overall – Instructor’s perception</td>
<td>End of the program survey</td>
<td>7/30 – disseminate; 8/2 - collect</td>
<td></td>
</tr>
</tbody>
</table>