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## Memorandum

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To: Setiati Sidharta and Mark Wong, Center for Science Excellence  
From: Valeria Romero, The Research and Impact Group, The Lawrence Hall of Science  
Re: Center for Science Excellence Formative Feedback Winter 2018  
Date: March 12, 2018

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An end of the fall semester, a survey was administered to Center for Science Excellence (CSE) Scholars in December 2017. The survey captured students' attitudes and interests in STEM fields of study and careers. In addition, survey questions asked participants to share their perspectives about their experiences and features of the program. Eighteen students completed the survey, though given students were able to skip any question there is variation in number of responses for some of the questions.

The following is an aggregate summary of students' responses for select questions to help inform ongoing program development.

### I. Students' Self-Reported Education and Career Goals

Educational Goals. 100% of students who responded indicated that they planned to transfer to a 4-year higher education institution, and 44% of them (4 out of 18) planned to obtain an associate's degree.

Career Goals. Among 18 respondents, 100% of them planned to pursue a career in Science, Technology, Engineering, or Math (STEM) fields. Of students who indicated what types of jobs they were planning to pursue, three said they were interested in engineering; two said they were interested in a computer science or an information technology career; seven were interested in a medical or health-related field; and three were interested in a laboratory-research career.

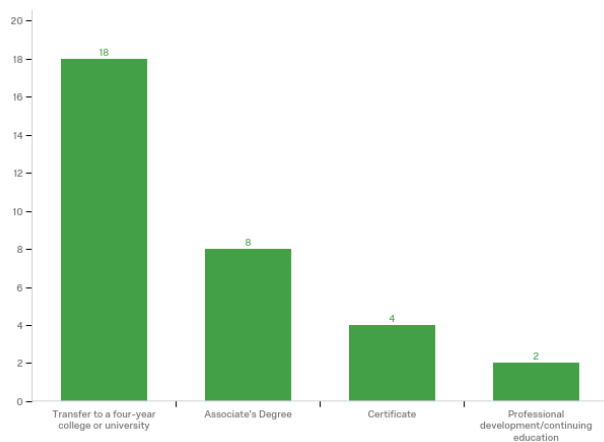


Figure 1. Students' self-reported educational goals (N=18)

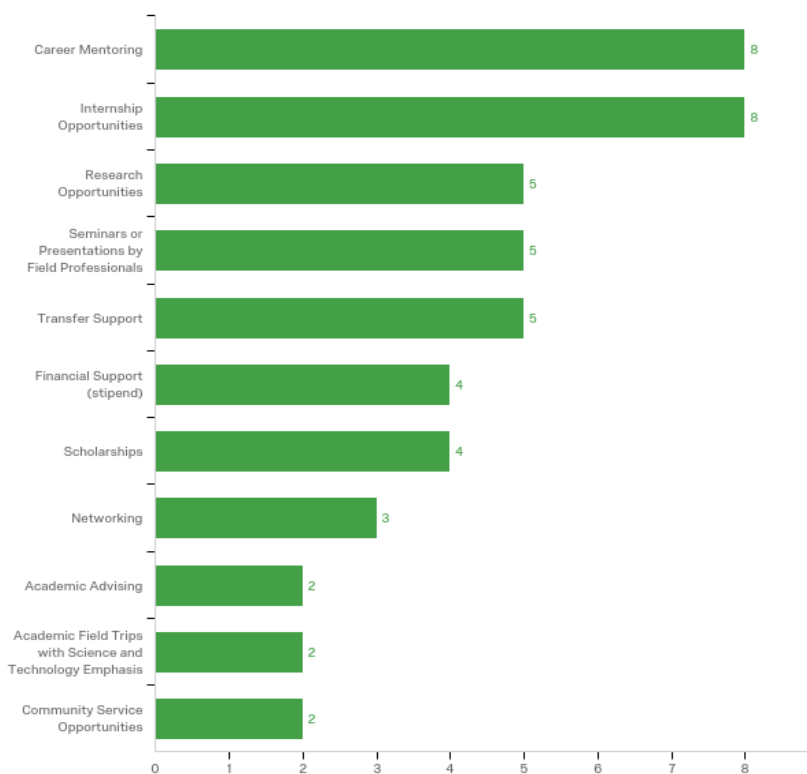
Student Employment. Per CSE's request, we added a question about the number of hours students work on- and/or off-campus. Out of 18 responses, 14 of students (77.8%) indicated that they work. In accordance with federal standards, the majority of those students work part time (i.e., less than 30 hours). Though, a few students reported working full time. Of those students who reported working, a number also reported working both on- and off-campus.

Table 1. Students' self-reported employment (approximate number of hours per week)					
	Doesn't work	Less than 10 hours	10-20 hours	20-40 hours	Over 40 hours
# of students	4	4	5	4	1

## II. CSE Program Expectations and Satisfaction

### Top Reasons Students Applied to CSE

Students indicated some reasons they were interested in applying to CSE. The top five reasons students indicated wanting to be part of CSE included (1) career mentoring, (2) internship opportunities, (3) research opportunities, (4) seminars or presentations by field professionals, and (5) transfer support. Additional top reasons are included in Figure 2.



**Figure 2. Students' self-reported reasons for applying to CSE (Count)**

### Students' Experiences and Perceptions of Participating in CSE Program Activities

*Frequency of use.* Students reported how frequently they used each of the CSE program activities on a 5-point scale (i.e., often, sometimes, rarely, never, I do not know what this is) during the Spring 2017 semester. Table 2 illustrates the top programs activities in which students most frequently participated (indicated by “often” or “sometimes”) including (1) Seminars or presentations by STEM Professionals (100%); (2) Faculty Mentoring (94.4%); (3) Academic Advising (89.89%); (4) Study groups and Career planning/advising workshops (83.33% each) and (5) Transfer support services (77.78%). The frequency distribution of using CSE program activities seems to be consistent with the aforementioned reasons that students applied to CSE.

Table 2. Most frequently used CSE program activities, indicated by “Often or Sometimes” (N=18)

CSE Program Activity	“Often” or Sometimes”
Seminars or presentations by STEM Professionals	100.00%
Faculty Mentoring	94.44%
Academic Advising	88.89%
Study Groups	83.33%
Career planning/advising workshops	83.33%
Transfer support services	77.78%

Students’ feedback from the survey and focus group interviews seemed to support these activities as the most frequently used. Differences in frequency of use likely reflects the perceived values students place on each of the activities. For instance, students often note that seminars are an opportunity for them to interact with other professionals or CSE alumni who are either working or studying in the field. Also, given that the one of the primary goals of CSE is to support students academic progress and transfer, one would expect the program activities where students are getting direct support in these areas to be more frequently used. More feedback about the value of activities is described in the “Perceived usefulness” section of this summary

Table 3 illustrates the five least used program activities, indicated by “rarely” or “never”, including academic field trips (83%), Math Jam (78%), faculty-led math workshops (72%), alumni event (61%), supplemental instruction sessions (50%), and science conference (50%). Among these least used program activities, Math Jam continues to be underutilized among CSE students since Spring 2017 (i.e., over 60% of students did not use). In the focus group interview, one student shared that they had only recently learned about Math Jam from another students. This student, in particular, noted that math is a particularly challenging area for them and had wished CSE had been more active in doing outreach for the program. Another student shared that their schedule conflicts with Math Jam so felt that CSE could provide (well versed and knowledgeable) tutors in math for students. It seems based on some initial feedback that despite students’ needing support with math, scheduling and/or lack of awareness about program offerings are barriers to students fully taking advantage of such support.

Table 3. Least frequently used CSE program activities, indicated by “rarely” or “never” (N=18)

CSE Program Activity	“Rarely” or “Never”
Academic field trips	83.33%
Math Jam	77.78%
Faculty-led math workshops	72.22%
Alumni events	61.11%
Supplemental instruction sessions	50.00%
Science conferences	50.00%

Academic field trip also continues to be an activity with little participation. Interestingly, this is an aspect that students continue to state they would like more in both survey responses and the focus group interview. In the focus group, students shared that at that point in time, information about field trips (and other program activities) are primarily distributed via email and consisted of various program updates. Students shared that this approach makes it difficult to stay attune to what is happening and suggested that having a bulletin board in combination with emails and announcements could enhance outreach

efforts, not just for field trips but all program activities. In addition, students shared that they would like to see field trips to include more opportunities for networking with professionals and learning about future job opportunities. Such places they mentioned included scientific labs, corporations and conferences. It seems that students often associated jobs with corporations, thought it may be worth exploring academic institutions or local organizations that also have intern or career opportunities. For example, research institutions have a number of research labs that often offer tours such as the CITRIS Lab at UC Berkeley or the CharmLab at Stanford University.

Students survey and interview responses continue to allude to scheduling being one of the biggest challenges that interfered with attending CSE program activities. Students consistently note how valuable the program activities are, yet in some instances alluded to if their schedule allowed or there were more opportunities they would participate in more activities. A couple of students explicitly shared frustrations about tutoring sessions being limited hours that often conflicted with courses or CSE program activities. This feedback was similarly shared last year. Given the context of this work it is equally important to recognize that it is difficult to accommodate everyone's schedules. Though being transparent about this can help to ease frustrations. Further, identifying other support services (either on campus or in the community) could also assure students' feelings of being supported by CSE.

*Perceived Usefulness of CSE program activities.* Students were asked to report how helpful each of the program activities were. Overall, students found program activities “helpful” or “very helpful” as illustrated in the Table 4, on the next page. In summary, “Seminars or presentations by STEM Professionals”, “Faculty Mentoring” and “Academic Advising” were the three program activities that most students found helpful; whereas the least students benefited from “Math Jam”.

Further, almost all students reported the seminars or presentations to be helpful. Feedback from survey and focus group interviews affirmed students' value of attending seminars because they provided an opportunity to interact with STEM professionals. A couple of students added in their survey responses that the seminars provided them with new perspectives, such as gaining insight into the business aspect of science. Though, students continue to reiterate the need for guest speakers and topics that address a wider range of STEM career pathways and interests. For example, in the focus group, a student reflected that the majority of seminars have featured professionals working in the medical or engineering field. While the student continues to attend the seminars, there is often a feeling that the student is missing out on the networking opportunities that other students have. This feedback was shared in the previous academic year, which can serve as a reminder that this is an area for continued growth. Recognizing that many of the guest speakers are drawn from personal connections and/or alumni in the local area, it may be worth identifying other ways to engage professionals/alumni. Web-based videoconference platforms can be a useful tool to engage alumni that are outside of the Bay Area. Many of these platforms, such as Google Hangouts and Zoom, have features that can support more interactive opportunities. However, it would be important to carefully consider that number of people that participate, as it would not be as effective in a typical seminar setting where 20-50 people are present. In addition, CSE can continue to play a role in sharing ongoing events on campus or in the community to support students' networking opportunities.

Table 4. Students' perceived usefulness of CSE program activities, indicated by "very helpful" or "helpful"

CSE Program Activity	Very Helpful or Helpful	N
Seminars or presentations by STEM Professionals	89%	18
Faculty Mentoring	89%	18
Academic Advising	89%	18
Mentoring groups with students who have common majors/courses	83%	18
Study Groups	78%	18
Career planning/advising workshops	78%	18
Transfer support services	72%	18
Peer tutoring sessions	72%	18
Faculty-led science workshops	67%	18
Peer-led Team Learning	67%	17
Community service opportunities	65%	18
Supplemental instruction sessions	59%	17
Faculty-led math workshops	56%	18
Networking events	50%	18
Alumni events	44%	18
Science conferences	44%	18
Math Jam	28%	18

Focus group interviews also affirmed that CSE provides students with invaluable support related to the transfer process. Students shared that not only does CSE provide academic advising but that faculty provide hands-on support and guidance throughout the process from identifying opportunities that would enhance their applications to talking through what students can include in their written statements to providing letters of recommendation.

In addition, students shared in survey responses and the focus group that perhaps one of the most valuable aspects of CSE is the networking opportunities. Through program activities, CSE students have the opportunity to meet professionals working in STEM fields and alumni who have transferred to other higher education institutions. CSE provides a space for students to build a sense of community where they can interact and foster relationships with faculty and their peers. According to students, CSE makes it "easier to find people" who have similar interests and goals, an aspect that students credit to support their motivation and persistence to achieve their goals. Interestingly, there were six programs activities that at least one-third of students identified as "not applicable". It is likely that students did not participated in these program activities or did not know what these activities were.

Table 5. Program activities reported "Not Applicable"

CSE Program Activity	Not Applicable (N=18)
Academic field trips	56%
Alumni events	44%
Networking events	39%
Math Jam	39%
Community service opportunities	35%

*Perceived confidence.* Students were presented with a list of statements that reflected their perceived confidence related to a range of skills and outcomes that CSE aims to foster. Students rated on a four-point scale (strongly agree, agree, disagree, strongly disagree) the extent to which they felt CSE had influenced their attitudes and interests in their academic and career pathways at the beginning of the semester retrospectively and at the end of the semester. As illustrated in Table 6, students' confidence levels in all of the targeted skills and outcomes have grown statistically significantly from the beginning of the program to the end of the program, suggesting that students perceive the program to be positively influencing their confidence levels. Though it is important to note that students' high ratings on some skills/outcomes at the beginning of the semester, suggest that students have relatively high perceptions of their confidence levels.

Item	N	Mean Beginning of Semester	Mean end of Semester	Mean Difference	t	Sig
Feel more prepared to write a personal statement and/or resume	17	2.06	3.12	1.06	4.52	0
Develop my interview skills	16	2.06	2.75	0.69	3.91	0
Develop my search skills for an internship and/or research experience	16	2.13	3.19	1.06	6.25	0
Feel more prepared to mentor young people who are interested in science	17	2.18	3.06	0.88	3.27	0.01
Seek leadership opportunities (e.g., mentor, tutor)	17	2.29	3	0.71	3.17	0.01
Develop my communication and team skills	17	2.41	3.12	0.71	3.43	0
Has helped me feel more confident in math	16	2.56	3.31	0.75	4.39	0
Do well in my math classes	17	2.76	3.41	0.65	4.4	0
Do well in my science classes	16	2.69	3.31	0.63	4.04	0
Increase my interests in transferring to a 4-year college/university	17	2.94	3.59	0.65	3.4	0
Increase my confidence in completing an associates degree	17	2.82	3.65	0.82	4.67	0
Broaden my knowledge about science (e.g., research, emerging fields)	17	2.47	3.53	1.06	5.84	0
Broaden my knowledge about science career pathways	17	2.41	3.41	1	5.22	0

### III. Summer Internships and Research Experiences

One component of CSE is helping students to apply and obtain summer internships and research experiences. Eight night percent of 18 respondents indicated that they were planning on applying to a summer internship and/or research experience for the 2018 summer term. Those that reported planning

on having a summer internship indicated they were interested in obtaining an internship at (1) government labs such as the U.S. Department of Agriculture (USDA) or Lawrence Berkeley National Lab; (2) medical research labs such as Children’s Hospital or UCSF; or an (3) engineering lab. A few students stated that they were not sure where they wanted to work yet. Two students were not planning on applying because they felt that they need to be more prepared academically so planning on taking additional courses. The spring survey will follow up with students about whether they applied as intended and where they will plan on working.



**Figure 3. Percentages of respondents who planned on applying for a summer internship and/or research experience.**