Evaluation of Math Supplemental Instruction, Fall 2017

CRC Office of Institutional Effectiveness

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Authors:
Sabrina Sencil, Research Analyst
Paul Meinz, IT Business/Tech Analyst

Background

At Cosumnes River College (CRC), the Supplemental Instruction (SI) Program provides course specific support for students in math. As part of the SI Program, student tutors (also referred to as SI Tutors) attend a particular course for the full semester and organize help sessions outside of class. This allows the SI to tailor support to the specific needs of students. In Fall 2017, a total of 36 math courses at CRC were assigned an SI. As part of an ongoing attempt to improve access and effectiveness of this program, the Office of Institutional Effectiveness at CRC conducts an evaluation on a term by term basis. This report summarizes the findings from fall 2017. This evaluation focuses on three primary questions: (1) Do different student groups visit their SI more or less; (2) does support from an SI lead to higher rates of course success and retention; and (3) what barriers do students experience when seeking help from an SI? To answer these questions, student SI visits were tracked throughout the spring semester, and a student survey was administered to students to determine potential barriers to help seeking. Note that for the purposes of this investigation, *course success* was defined as receiving an A, B, C, or P in a course, and *retention* was defined as receiving any grade but a W.

Summary of Findings

1. Approximately 25.6% of students in courses participating in the Supplemental Instruction Program attended an SI session. This is higher than spring 2017 where 17.6% of students attended SI sessions. However, the program decreased the number of math sections 77 to 36. A total of 353 students were helped by SI Tutors in fall 2017 compared to 498 students in spring 2017, and 365 students in fall 2016.
2. Older students were more likely to attend SI sessions compared to younger students in the same course with the same gender and race/ethnicity. Female students were more likely to attend than their male peers.
3. Students who attended SI sessions were more likely to succeed than students who did not attend SI sessions in the same class (e.g. Math 100) with the same race/ethnicity (52.4% vs. 47.1%, respectively)
    a. This improvement in success was smaller when compared to previous evaluations. In spring 2017[1], the SI and non-SI success rates were 58.2% vs. 50.9%, and 61.1% vs 47.2% in fall 2016[2].
4. Students who attended SI sessions were more likely to be retained than students who did not attend SI sessions in the same class (e.g, Math 100) with the same age and race/ethnicity (77.1% vs. 74.5%, respectively).
    a. This improvement in retention was smaller when compared to previous evaluations. In spring 2017, the SI and non-SI retention rates were 85.9% vs. 78% and, 86.6% vs. 76.8% in fall 2016.
5. Survey results included feedback from both students who visited their SI Tutors and those who did not; a response rate of 44.4% (610 out of 1,374). Out of 607 responses, 38.1% reported attending an SI session.
    a. Students who visited with their SI Leaders most frequently indicated that wanting to improve their grade was the primary reason they sought help (40%). Nearly all would recommend SI to other students (94% of 235). Overall, the students rated their SI Leaders favorably for the following traits: knowledgeable, approachable, able to match their teaching style to that of the instructors, and helped improve their grade in class.

[1] CRC Evaluation of Math Supplemental Instruction, Spring 2017
[2] CRC Evaluation of Math Supplemental Instruction, Fall 2016

b. Students who indicated that they did not attend an SI session most frequently reported scheduling conflicts (40.8%) as the primary reason for why they did not seek assistance from their SI Tutors. Students shared that they would be encouraged to seek out help from their SI Tutors if there was more availability of SI sessions or if students felt they were struggling with the course material.
c. General comments from all student respondents about the program consisted of positive feedback of both the program and specific SI Tutors, and suggestions for improvement. For example, students suggested the SI program expand to support more math courses and build awareness so students understand the benefits, as well as increase the availability and the length of SI sessions.

Limitations

As with previous evaluations, the primary limitation in this continuous evaluation remains that students who seek help from the SI might be different from other students in motivation and/or other psychological factors. However, a previous evaluation revealed that academic performance in math did not predict student help seeking. This suggests that the effects described within this evaluation may not necessarily be attributed to a circumstance wherein only good students sought help.

Recommendations

The improvement in success and retention for students who visited their SI for help replicated previous evaluations. Schedule conflicts continue to be barriers to student usage of SI. With these findings in mind, the Office of Institutional Effectiveness makes the following recommendations:

1. Continue to improve scheduling and availability of SI tutoring sessions, perhaps by including SI sessions in the course catalog to inform student decisions about enrollment.
2. Expand evaluation to include comparing success and equity outcomes between courses that participated in SI program and those that did not in the same term.

Student Success and Retention for SI usage

Method

Visits to SI sessions were tracked on a daily basis. After the spring semester ended, these data were entered into a spreadsheet and grades/demographic information from the Los Rios Community College District PeopleSoft database were combined with attendance data. This final dataset was used to conduct analysis relevant to the first two questions of the study: Do different student groups visit their SI more or less and does support from an SI lead to higher rates of course success and retention?

Student Population Description, Usage Rates, and Success/Retention

Demographics, usage rates, success/retention rates for students that used SI vs. those who did not are presented in *Table 1*. In terms of ethnicity, students who are Pacific Islander had the highest usage rate (34.6%). Additionally, students who are older and students who are female were more likely to use SI. In *Table 2*, usage rates and success/retention rates for students who used SI vs. those who did not are presented for each math course. Students in Math 343 had the highest usage rate (48.7%), and MATH 120 had the largest number of students visit with their SI Tutor outside of class (n=81).

Table 1. Demographics, Success, and Retention for SI Usage

	Usage			Success			Retention		
Demographic	**Total**	**Used SI**	**%**	**Non-SI**	**SI**	**Overall**	**Non-SI**	**SI**	**Overall**
Race									
African American	134	39	29.1%	29.5%	25.6%	28.4%	66.3%	66.7%	66.4%
Asian	339	86	25.4%	62.1%	62.8%	62.2%	81.8%	80.2%	81.4%
Filipino	68	15	22.1%	58.5%	53.3%	57.4%	84.9%	66.7%	80.9%
Hispanic/Latino	415	109	26.3%	37.3%	43.1%	38.8%	71.6%	70.6%	71.3%
Multi-Race	88	19	21.6%	42.0%	47.4%	43.2%	69.6%	78.9%	71.6%
Native American	10	5	50.0%	20.0%	20.0%	20.0%	80.0%	60.0%	70.0%
Other/Unknown	14	4	28.6%	30.0%	50.0%	35.7%	70.0%	75.0%	71.4%
Pacific Islander	26	9	34.6%	64.7%	44.4%	57.7%	76.5%	88.9%	80.8%
White	280	67	23.9%	50.2%	74.6%	56.1%	72.8%	91.0%	77.1%
Gender									
Female	715	213	29.8%	46.6%	52.6%	48.4%	86.0%	78.4%	79.9%
Male	635	133	20.9%	47.8%	52.6%	48.8%	86.3%	78.1%	79.4%
Unknown	24	7	29.2%	41.2%	42.9%	41.7%	75.0%	66.7%	67.7%
Age									
24 and Younger	1,111	251	22.6%	46.9%	53.0%	48.2%	75.2%	76.5%	75.5%
25 or Older	263	102	38.8%	48.4%	51.0%	49.4%	70.8%	78.4%	73.8%
Total	**1,374**	**353**	**25.7%**	**47.1%**	**52.4%**	**48.5%**	**74.5%**	**77.1%**	**75.2%**

Table 2. Demographics, Success, and Retention for SI Usage

	Usage			Success			Retention		
Course	Total	Used SI	%	Non-SI	SI	Overall	Non-SI	SI	Overall
MATH 20	40	12	30.0%	53.6%	25.0%	45.0%	82.1%	83.3%	82.5%
MATH 30	112	19	17.0%	55.9%	57.9%	56.3%	89.2%	94.7%	90.2%
MATH 100	320	70	21.9%	40.0%	54.3%	43.1%	68.8%	77.1%	70.6%
MATH 101	34	3	8.8%	54.8%	66.7%	55.9%	77.4%	100.0%	79.4%
MATH 102	18	5	27.8%	53.8%	60.0%	55.6%	76.9%	100.0%	83.3%
MATH 110	32	7	21.9%	44.0%	14.3%	37.5%	68.0%	57.1%	65.6%
MATH 120	337	81	24.0%	41.0%	45.7%	42.1%	69.1%	69.1%	69.1%
MATH 125	121	39	32.2%	48.8%	46.2%	47.9%	80.5%	74.4%	78.5%
MATH 335	125	46	36.8%	53.2%	43.5%	49.6%	70.9%	60.9%	67.2%
MATH 343	39	19	48.7%	80.0%	84.2%	82.1%	80.0%	94.7%	87.2%
MATH 350	28	9	32.1%	57.9%	77.8%	64.3%	84.2%	100.0%	89.3%
STAT 300	168	43	25.6%	52.0%	67.4%	56.0%	80.8%	88.4%	82.7%
Total	**1,374**	**353**	**25.7%**	**47.1%**	**52.4%**	**48.5%**	**74.5%**	**77.1%**	**75.2%**

Analysis (Technical Specifications)

Logistic regressions, assuming quasi-binomial error, were used to test for differences in SI **usage**. There were no differences in likelihood of using SI on the basis of race/ethnicity, $\Delta\chi^2(2) = 7.4433$, *ns*. Female students were more likely to utilize SI than their male peers, $\Delta\chi^2(2) = 12.06$, $p < .01$. Older students were more likely to seek help than younger students, $\Delta\chi^2(1) = 32.992$, $p < .001$. This means an older student was more likely to seek help when compared to a younger student with the same gender and ethnicity. Finally, students in MATH 100 were significantly less likely to seek help from SI Tutors than their peers in MATH 125, 335, and 343 , $\Delta\chi^2(11) = 47.329$, $p < .001$.

Race/ethnicity and course were significant predictors of student **success**. These variables were therefore entered as control variables when testing for differences between students that used SI vs. those who did not. In short, the number of times a student visited their SI for help significantly predicted success, $\Delta\chi^2(1) = 18.119$, $p < .001$. A student who visited their SI many times had a higher likelihood of succeeding than a student with the same class and race/ethnicity who visited their SI less. In terms of retention, age, race/ethnicity, and course were significant predictors of student **retention**. These variables were entered as control variables when testing for differences between students who used SI and those who did not. The number of times a student visited their SI for help significantly predicted retention, $\Delta\chi^2(1) = 20.666$, $p < .001$. A student who visited their SI many times had a higher likelihood of succeeding than a student with the same class and ethnicity who visited their SI less.

Analysis: SI Survey

Method

Near the end of the fall 2017 semester, students in courses participating in SI were asked to complete a paper survey. The survey asked students if they were aware their class had an SI Tutor, and if so, did they attend any sessions. Students who attended SI sessions were asked to indicate their primary reason for seeking help and rate their SI Tutor traits (knowledgeable, approachable, helpful, and helped

improve grade in class). They were also asked if they would recommend SI to other students. Students who did not attend SI sessions were asked to indicate their primary reason for not seeking help from their SI Tutor and what could have encouraged their attendance. All students were asked to provide any additional feedback about the SI program.

Results

Slightly more than half of the students in classes that offered SI participated in the survey (610 out of 1,374; a response rate of 44.4%). Responses from the fall 2017 were very similar to the spring 2017 survey results. More than two-thirds (38.7%) reported they sought help from their SI Tutors. Students most frequently answered "wanting to improve their grade" as their primary reason for seeking assistance (40%), followed by 28.5% indicating they always utilize support services. Nearly all who received assistance from their SI Tutors would recommend SI to other students (94%, 221 out of 235). Students rated their SI Tutors favorably by agreeing that their SI Tutors were knowledgeable, approachable, able to match their teaching style to that of the instructors, and helped improve their grade in class. Students used a 5 point scale, 1=*Strongly agree*, 5=*Strongly disagree*, to indicate their level of agreement. The average rating per quality was <2.0, indicating students general agreed with the statements.

For the students who did not attend an SI session, scheduling conflicts were most frequently identified as the primary reason they did not seek help (40.8%), followed by 28.6% who felt they did not need assistance from their SI Tutors. Similar to their response for why they did not seek help from their SI Tutors, students frequently commented that resolving scheduling conflicts and/or needing help in the class would have encouraged them to seek (n=309).

All student respondents had the opportunity to provide any additional feedback about the SI program. Out of the 216 comments, students generally provided positive feedback about the SI Tutors and the program, some students suggested the program expand to more math courses, build awareness so students understand the benefits, have larger rooms, increase the number and length of sessions during the week to help to address scheduling conflicts.