Evaluation of the Supplement Instruction Program, Fall 2015

CRC Research Office

Spring 2016

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Background

At Cosumnes River College, Supplemental Instruction (SI) supports learning outside of the classroom. Classes that include SI have a designated "SI Leader." The SI Leader is a student who has successfully completed the course prior to the term and works with the instructor to provide personal academic support to students enrolled in the course. Unlike tutoring, where tutors support students from various classes and levels, the SI program is designed such that the assigned "SI Leader" is available to all students for one particular class. In fall 2015, Supplemental Instruction (SI) was offered in 15 class sections in Economics, Math, and Statistics. Below is a list of the courses that participated in SI:

- ECON 302 (2)
- MATH 100 (1)
- MATH 120 (4)
- MATH 30 (4)
- MATH 335 (3)
- STAT 300 (1)

This mid-year report provides an evaluation of Cosumnes River College's Supplemental Instruction (SI) program in fall 2015. The evaluation of SI was designed to answer the following research questions:

1. Do students who participate in SI succeed at higher rates than their class peers?
    a. Do different groups of students participate in SI at different rates?
2. Is SI effective for some student groups but not for others?
3. What motivates students to use SI?
4. What are the reasons students do not use SI?

To answer these research questions, the Research Office collected data from three sources: student records (final grades and student demographics), SI attendance from SI sign-in sheets, and surveys.

Summary of Findings

In the fall 2015 term, there were 607 students enrolled in courses that participated in SI. Out of the 607 students, 104 (17.1%) were identified as having met with their SI Leader for academic support. Twenty-one of these students only attended one SI session.

Do students who participate in SI succeed at higher rates than their class peers?

The overall success rate for students who used SI was slightly higher than the students who did not (49.0% vs 41.7%); however, this difference was only statistically significant after controlling for ethnicity and gender ($p < .05$). This means that a student who used SI will perform better on average than another student with the same gender and ethnicity.

Is SI effective for some student groups but not for others?

The impact of Supplemental Instruction was similar for most student groups.

Do different groups of students participate in SI at different rates?

When comparing the student groups' SI participation rates, students who were 25 years of age or older, African American, Hispanic/Latino, or female participated at higher rates than their peers.

What motivates students to use SI?

To determine what motivated students to participate in SI, an online survey was administered towards the end of the fall 2015 term to all students enrolled in courses that offered SI. Of the 127 students who

responded to the survey, 44 reported that they used SI. When asked what their primary reason for getting help from the SI Leader was, the most frequent response was that the students always utilize available services (31.8%). Some students reported that they wanted to improve their grade in the class (18.2%) or that they had not done well in the subject in the past (11.4%).

What are the reasons students do not use SI?

In the same online survey, students who responded that they did not use SI were asked to indicate their primary reason for not utilizing the academic support. Of the 82 students, 43.9% indicated that their schedules conflicted with the availability of the SI Leader, and another 8.5% indicated they intended to use SI but could not find the time. Students who did not use SI provided open-ended feedback and generally stated that they would be more motivated to attend SI if the availability did not conflict with their schedules. The SI Leaders were also surveyed about their experience and the SI program. The SI Leaders feedback indicated the same factors as the students; it was difficult for the SI Leaders to make their schedules fit with that of the students.

Limitations

There were several limitations in conducting the fall 2015 evaluation for SI. The small number of participants across the courses that offered SI (n=104) reduces the power of statistical analyses to find an effect and limits the ability to detect effects in subgroups of students. Additionally, students use SI might be different than students who did not on other factors such as motivation; and, factors like motivation might account for the difference between the two groups rather than SI usage.

The survey response was also too small to analyze differences between courses or student groups. Furthermore, the attendance tracking for SI sessions was limited because students did not provide their student IDs when signing in, and it was not clear as to whether or not every SI session was accounted for in the sign-in sheets provided for fall 2015. For example, there were 10 students who responded to the survey that they used SI; however, their participation was not recorded in the attendance sheets.

Recommendations

This evaluation of SI revealed that low participation levels negatively affected the impact of SI.

For this reason, the Research Office makes the following recommendations:

1. Investigate online scheduling tools (i.e., Doodle) that will support SI Leader and student communication of availability prior to the start of the term/semester.
2. Inform students of the SI sessions in the class schedule whenever possible.
3. Assign two SI Leaders to each class to increase the number of options for students.
4. Improve the method of tracking attendance – specifically, tracking each session regardless of attendance and including the students' IDs on the attendance sheets. Some consideration to using SARS to track attendance may be warranted.
5. Consider alternatives methods of motivating students to participate in SI. For example, requiring at least one visit with the SI Leader or incentivizing (i.e., extra credit) participation in SI sessions.
6. Ask students who have attended SI session to share their experience and benefits with the class.

Student SI Usage and Outcomes

Method

During the fall 2015 semester, paper sign-in sheets were used to track student attendance in SI sessions. The sign-in sheets recorded the time and date of the session, the names of the students who attended, and the name of the course. The Research Office created a dataset that included the student names, student ids, and the SI course(s). Using the students' name and the name of the courses, students' attendance from the sign-in sheets were logged into the dataset. In February 2016, students' official grades in the SI courses and demographic data (age, gender, and ethnicity) were appended to the dataset. The dataset was then used to evaluate the Supplemental Instruction program.

Out of the 607 students enrolled in courses where SI was provided, 104 were identified as having participated based on the SI session sign-in sheets (17.1%). Table 1 below displays the characteristic differences between the students who participated in SI Sessions and those who did not. Students who are older (25 and older), female, African American, and/or Hispanic/Latino were more likely to visit their SI Leader during SI sessions. The median number of visits per student who visited SI was 6. (The median was used because of the large number of students who visited SI once and the handful of students who attended 20 or more SI sessions.)

Table 1. *Student Characteristics and SI Participation*

Student Demographic Characteristics	SI Participants	Non-Si Participants	Difference
Gender			
Female	63.5%	48.5%	15.0%
Male	35.6%	50.5%	-14.9%
Unknown	*	*	
Ethnicity/Race			
African American	15.4%	8.7%	6.6%
Asian	15.4%	29.2%	-13.8%
Filipino	*	5.2%	—
Hispanic/Latino	34.6%	28.8%	5.8%
Multi-Race	*	7.2%	
Native American/Alaskan Native	—	—	—
Pacific Islander	*	*	—
Unknown	*	*	—
White	19.8%	18.6%	1.2%
Age Group			
19 or younger	30.8%	40.6%	-9.8%
20-24	31.7%	43.9%	-12.2%
25-29	18.3%	7.2%	11.1%
30-39	14.4%	4.8%	9.7%
40 or older	4.8%	3.6%	1.2%
Median Number of SI Visits	6		
Total Number of Students (N=607)	**104**	**503**	

* represents fewer than 10 students

Data sources: SI Sessions Sign-In Sheets; LRCCD Student Information System (PeopleSoft), February 8, 2016

Table 2 displays the participation rate by course, and the success outcomes by SI participation status. Overall, the participation rate for all courses was 17.1%. Generally, the students who participated in SI sessions achieved a higher average success rate in each of the courses, with the exception of STAT 300. However, these differences were not statistically significant.

Table 2. *SI Participation Rates and Success Outcomes by Course*

Course	Number of Students	Number of SI Participants	Participation Rate	SI Participant Success Rate	Non-SI Participant Success Rate	Difference* (SI – Non-SI)	Overall Success Rate
ECON 302	81	8	9.9%	87.5%	56.2%	31.3%	59.3%
MATH 100	43	9	20.9%	55.6%	50.0%	5.6%	51.2%
MATH 120	172	35	20.3%	45.7%	43.1%	2.6%	43.6%
MATH 30	159	25	15.7%	52.0%	38.1%	13.9%	40.3%
MATH 335	109	21	19.3%	42.9%	38.6%	4.2%	39.4%
STAT 300	43	6	14.0%	16.7%	21.6%	-5.0%	20.9%
Total	**607**	**104**	**17.1%**	**49.0%**	**41.7%**	**7.3%**	**43.0%**

***Not enough data to test for statistically significant differences for each course.**
Data sources: SI Sessions Sign-In Sheets; LRCCD Student Information System (PeopleSoft), February 8, 2016

Analysis (Technical Specifications)

Initially, a logistic regression model, assuming a quasibinomial error term (commonly used to test for differences in binomial outcome variable), was used to predict the probability of student success from the number of times a student visited their SI Leader. Prior to entering the number of visits as a predictor, the demographic variables age, gender, and ethnicity were entered as predictors of student success. Ethnicity significantly predicted a student's probability of success, $\Delta\chi^2(4) = 27.07$, $p < .001$. Gender uniquely predicted a student's probability of success after controlling for ethnicity, $\Delta\chi^2(2) = 5.99$, $p < .10$.

After controlling for ethnicity and gender, the number of visits was entered as a predictor of success and was significant, $\Delta\chi^2(1) = 5.50$, $p < .05$. A student who used SI will perform better than another student with same ethnicity and gender. However, the number of students who used SI was small (n=104) and therefore this analysis may have been underpowered.

Table 3 displays the projected probability of success by ethnic group from zero to 40 visits. Because of the increase in the probability of success per SI visit is non-linear, increasing the average number of visits for *all* students could reduce achievement gaps between ethnic groups. Unfortunately, increasing visits for all students would not appear to reduce differences between groups until after 20 visits. Unfortunately, increasing visits for all students would not appear to reduce differences between groups until after 20 visits. The column "Avg. Difference" is a measure of the average difference in probability of success between groups.

Table 3. *Probability of Success by Ethnic Group and Number of Visits*

	Probability of Success by Ethnicity					
Number of Visits	**African American**	**Asian/Filipino/Pacific Islander**	**Hispanic/Latino(a)**	**Multi-Race/Unknown/Other**	**White**	**Avg. Difference**
0	16.62%	49.98%	35.42%	43.79%	48.75%	12.26%
5	19.94%	55.52%	40.65%	49.32%	54.30%	13.09%
10	23.73%	60.93%	46.11%	54.86%	59.74%	13.70%
15	27.98%	66.07%	51.66%	60.29%	64.96%	14.05%
20	32.68%	70.87%	57.17%	65.47%	69.84%	14.12%
25	37.74%	75.24%	62.51%	70.32%	74.31%	13.89%
30	43.09%	79.15%	67.57%	74.74%	78.32%	13.38%
35	48.61%	82.58%	72.24%	78.71%	81.86%	12.63%
40	54.16%	85.56%	76.47%	82.20%	84.93%	11.70%

In the previous model, the probability curve – modelling the increase in probability of success per SI visit – was the same for all groups. Further analysis was conducted to see if the probability curve for success based on the number of SI visits was different for each ethnicity. There was no evidence to suggest that the curve for SI was different in some groups and not in others.

SI Surveys: Students, Faculty, and SI Leaders

Method

Towards the end of the fall 2015 semester, three online surveys are administered to students, faculty, and SI Leaders. The student survey asked students in SI courses if they were aware that there as an SI Leader assigned to their course, if they sought help from the SI Leader, and the primary reasons for why they did/did not get help from the SI Leader. The end of the survey asked if they would recommend it to future students and collected open-ended comments on what improvements could be made to the Supplemental Instruction program.

In December 2015, faculty and SI Leaders were surveyed about their experiences with the SI program for fall 2015. The SI Leaders were asked if they felt prepared in their role as a SI Leader, if the faculty communicated their expectations, and if the SI Leaders attended the classes for which they were assigned. Additionally, SI Leaders were asked to share their methods for encouraging student participation, as well as their observations on what factors prevent students from attending SI sessions. The end of the survey asked them to rate different elements of the SI program (i.e., training, relationship with instructor, location of SI sessions, etc.) and to share their thoughts on what they believe could improve the Supplemental Instruction program.

Like the SI Leader survey, the faculty survey asked how faculty encouraged their students to attend SI sessions. The survey also asked them to rate the SI Leaders on their accessibility, rapport with students, attendance in class, and communication with the faculty. They were also asked to indicate how frequently they communicated with their SI Leaders in-person, during class, by phone, and/or email. The end of the survey asked a series of questions as to whether or not they had previously had an SI Leader in their class, plan to have an SI Leader in their next class, and would recommend the SI program to other faculty. As with the student and SI Leader survey, open-ended comments for program improvement were collected at the end of the faculty survey.

Student Survey

Out of 607 students, 127 responded to the student survey (20.9% response rate). Most of the surveyed students were aware that the course had an SI Leader (81.9%); however, only 44 (34.6%) reported that they participated in SI sessions (one student did not respond to the question at all). When asked their primary reason for using SI, almost a third (31.8%) indicated they always take advantage of help, 18.2% wanted to improve their grade in the class, and 15.2% either found SI helpful in their previous class (11.4%) or had not done well in the subject in the past (3.8%). Most students reported that they received help from their SI Leader in class. (SI usage in class was not tracked with the SI sign-in sheets.) When asked to evaluate their SI Leaders, the majority of the surveyed students agreed that their SI Leader was knowledgeable (66%), approachable (66%), and helpful (66%). Most of the students also agreed that SI helped improve their course grade (61%) and would recommend SI to other students (66%).

Out of the 127 who participated in the survey, 82 (64.6%) reported they did not use SI. When asked their primary reason for not using SI, more than half (53.4%) indicated they either intended to use SI but could not find the time (8.5%) or the times conflicted with their schedules (43.9%), 14.6% were not aware their class offered SI, and 17.1% felt they did not need the additional help. In their open-ended feedback, students indicated they would be more motivated to attend SI sessions if the SI sessions' dates and times did not conflict with their schedule.

SI Leader Survey

Eight out of the 16 SI Leaders participated in the online survey (50% response rate). All but one felt adequately prepared in their role as SI Leaders (87.5%). All SI Leaders felt the faculty expectations were clearly communicated to them. Half of the SI Leaders encouraged students to seek their assistance by conveying an openness and willingness to assist. Schedule conflicts were also identified by SI Leaders; they reported difficulty in making their schedule fit with the students' schedules. Seven out of the eight SI Leaders attended the class for which they were the SI Leader. All SI Leaders were satisfied with the communication, help, and accessibility of the faculty, as well as the space provided to hold SI sessions and the level of support. Lastly, all of the SI Leaders were satisfied with the ongoing training offered for SI.

Faculty Survey

Seven out of eight SI faculty responded to the online survey (87.5% response rate). All faculty encouraged students to use SI during class time, and six faculty reported they provided class time to specifically work with the SI. All faculty agreed that the SI Leaders were punctual, accessible, and had good rapport with students; and, 85.5% agreed the SI Leaders regularly communicated with them. The faculty's primary means of communication with the SI Leader was in class. Out of the seven respondents, three indicated they had not had an SI Leader in the past (two did not answer the question). Each of the faculty reported they would have an SI leader again.