Evaluation of Math Supplemental Instruction, Fall 2016

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Background

At Cosumnes River College (CRC), the Supplemental Instruction Program provides course specific support for students in math. As part of the Supplemental Instruction Program, tutors (a.k.a. supplemental instructors (SIs) 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 given the current course content. In fall 2016, a total of 45 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 conducted an evaluation in fall 2016. This evaluation focused 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 and a survey was administered to SIs 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 20.5% of students in courses participating in the Supplemental Instruction Program attended an SI help session. This is slightly lower than the spring 2016 evaluation where 24.6% of students attended. However, note that due to expansion of the program, a total of 365 students were helped by SIs in fall 2016 compared to 220 in spring 2016.
2. Older students were more likely to attend SI help sessions compared to younger students with the same gender and ethnicity. On the other hand, there were no differences in usage on the basis of gender or ethnicity. This is inconsistent with previous evaluations wherein students who are African American had higher rates of help seeking. However, it should be noted that students who are African American were amongst the most likely to attend an SI help session, although this difference was not statistically significant.
3. Students who attended SI help sessions were more likely to succeed than students who did not attend SI help sessions with the same class (e.g. Math 100), gender, age, and ethnicity (*Success* = 61.1% vs 47.2%, respectively). Students were incrementally more likely to succeed with each visit to a help session.
4. Students who attended SI help sessions were more likely to be retained than students who did not attend SI help sessions with the same class (e.g, Math 100), gender, age, and ethnicity (*Retention* = 86.6% vs. 76.8%, respectively). Students were incrementally more likely to be retained with each visit to a help session.
5. The vast majority of SIs believed that the number one barrier to student usage was scheduling difficulties. The scheduling of SI help sessions often conflicted with chaotic student schedules.
6. A substantial portion of SIs believed that messaging about the Supplemental Instruction Program could be improved – either through instructor endorsement or through an advertising campaign.

Limitations

There is one primary limitation to this study. Namely students who seek help from the SI might be different from other students in motivation and/or other psychological factors. The difference between students who seek and do not seek assistance might therefore be explained by motivation

or good study habits – and not necessarily by the help received. 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 contradicted previous evaluations that found minimal effects of supplemental instruction. Moreover, the barriers to student usage of SI appear to be similar to previous evaluations. With these findings in mind, the Office of Institutional Research makes the following recommendations:

1. Continue ongoing improvements to training for SIs.
2. Improve scheduling and availability of SI tutoring sessions, perhaps by including SI sessions in the course catalog to inform student decisions about enrollment.
3. Given the slightly lower attendance rate, and recommendations from SIs, messaging about the program may need improvement. There is evidence to suggest that *mastery oriented* messages might improve help seeking rates. A mastery oriented message focus on improvement of a skill rather than course performance. For example, a non-mastery oriented message might read "Need to improve your math grade? Come to the Math Center", whereas a master oriented message might say "Come to the Math Center to improve your math skills!" Focusing on mastery as opposed to course performance potentially removes the stigma of asking for help.

Student Success and Retention for SI usage

Method

Visits to SI help sessions were tracked on a daily basis. At the end of the semester, these data were entered into a spreadsheet and a script was written to combine the attendance data with grades/demographic information from the Los Rios Community College District Peoplesoft database. 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 and 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 African American and students who are Pacific Islander were more likely to visit their SI. Additionally, students who are older and students who are female were more likely to use SI. In *Table 2*, success/retention rates for students who used SI vs. those who did not are presented for each math course. Students in Math 335 had the highest usage rate.

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	212	57	26.9%	32.9%	45.6%	36.3%	64.5%	86.0%	70.3%
Asian	400	67	16.8%	55.0%	65.7%	56.8%	82.3%	89.6%	83.5%
Filipino	113	23	20.4%	62.2%	65.2%	62.8%	84.4%	82.6%	84.1%
Hispanic/Latino	535	117	21.9%	40.0%	59.0%	44.1%	73.9%	87.2%	76.8%
Multi-Race	119	20	16.8%	44.4%	65.0%	47.9%	71.7%	95.0%	75.6%
Other	26	7	26.9%	36.8%	57.1%	42.3%	84.2%	71.4%	80.8%
Pacific Islander	31	10	32.3%	28.6%	70.0%	41.9%	71.4%	80.0%	74.2%
White	342	64	18.7%	55.0%	70.3%	57.9%	80.6%	84.4%	81.3%
Gender									
Female	920	211	22.9%	51.3%	68.7%	55.3%	78.6%	93.4%	82.0%
Male	819	145	17.7%	43.5%	52.4%	45.1%	75.4%	77.9%	75.8%
Unknown	39	9	23.1%	33.3%	22.2%	30.8%	66.7%	66.7%	66.7%
Age									
24 and Younger	1437	249	17.3%	46.1%	61.0%	48.7%	77.3%	85.1%	78.6%
25 or Older	341	116	34.0%	52.9%	61.2%	55.7%	74.2%	89.7%	79.5%
Total	**1778**	**365**	**20.5%**	**47.2%**	**61.1%**	**50.1%**	**76.8%**	**86.6%**	**78.8%**

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	43	8	18.6%	31.4%	62.5%	37.2%	77.1%	87.5%	79.1%

MATH 30	253	47	18.6%	47.6%	59.6%	49.8%	80.6%	95.7%	83.4%
MATH 100	478	60	12.6%	46.9%	53.3%	47.7%	82.8%	90.0%	83.7%
MATH 102	40	6	15.0%	47.1%	100.0%	55.0%	82.4%	100.0%	85.0%
MATH 110	35	10	28.6%	32.0%	30.0%	31.4%	60.0%	60.0%	60.0%
MATH 120	327	58	17.7%	41.3%	50.0%	42.8%	69.5%	82.8%	71.9%
MATH 125	77	20	26.0%	57.9%	75.0%	62.3%	75.4%	90.0%	79.2%
MATH 335	201	78	38.8%	44.7%	59.0%	50.2%	65.0%	78.2%	70.1%
MATH 350	37	10	27.0%	66.7%	100.0%	75.7%	81.5%	100.0%	86.5%
MATH 401	57	10	17.5%	44.7%	80.0%	50.9%	70.2%	90.0%	73.7%
STAT 300	230	58	25.2%	58.1%	70.7%	61.3%	80.2%	89.7%	82.6%
Total	**1778**	**365**	**20.5%**	**47.2%**	**61.1%**	**50.1%**	**76.8%**	**86.6%**	**78.8%**

Analysis (Technical Specifications)

Logistic regressions, assuming quasi-binomial error, were used to test for differences in SI usage, success, and retention. In terms of usage, logistic regressions were used to test for differences on the basis of age, gender, and ethnicity. In each analysis, all demographic variables were entered as control variables. For example, when testing for significant differences in usage based on gender, ethnicity and age were entered as control variables. There were no differences in likelihood of using SI on the basis of gender, $\Delta\chi^2(2) = 2.19$, *ns,* such that students who are female were just as likely as students who are male to visit their SI. There were also no significant differences in the likelihood of usage across ethnicities, $\Delta\chi^2(7) = 9.27$, *ns.,* such that no ethnicity was significantly more likely to seek help. Nevertheless, it should be noted that in previous evaluations of help seeking, students who are African American were more likely to seek help. In this evaluation, they had the second highest usage rate. Finally, older students were more likely to seek help than younger students, $\Delta\chi^2(1) = 55.34$, $p < .001$. This means an older student was more likely to seek help when compared to a younger student with the same gender and ethnicity.

In terms of student success and retention, race, gender, ethnicity, and course were all significant predictors of student success and retention. 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, $\Delta\chi^2(1) = 48.71$, $p < .001$. A student who visited their SI many times had a higher likelihood of succeeding than a student with the same class, age, gender, and ethnicity who visited their SI less. Additionally, the number of times a student visited their SI for help significantly predicted retention, $\Delta\chi^2(1) = 39.34$, $p < .001$. A student who visited their SI many times had a higher likelihood of succeeding than a student with the same class, age, gender, and ethnicity who visited their SI less.

Analysis: SI Survey

Method

Near the end of the fall 2016 term, SIs were administered a survey to determine potential improvements to the program and barriers to student help seeking. SIs were asked if they felt adequately supported throughout the semester and if they attended their assigned course regularly.

They were asked how they encourage students to attend SI tutoring sessions and about factors that prevent students from seeking help. They were then asked to rate their satisfaction regarding various facets of the SI program: communications with the instructor, help provided by the instructor, accessibility of the instructor, availability of space to conduct SI sessions, support provided by the SI coordinator, and ongoing training. Finally, they were asked to provide general comments on how the program could be improved.

Results

Of the 23 SIs that completed the survey, nearly all felt adequately supported (*N* = 21; 91.3%) and nearly all attended their assigned class (*N* = 22; 95.65%). Most of the SIs reported publicly encouraging students to come to their tutoring sessions (*N* = 12; 52.17%). Some SIs offered incentives (e.g., extra credit, snacks; *N* = 6; 26.09%), encouraged students and the instructor to spread the word about SI (*N* = 4; 17.39%), tried to convey personal accessibility through social interactions (*N* = 4; 17.39%), or made sure to offer quality assistance (*N* = 4; 17.39%). When asked about factors that prevent students from seeking help, nearly all the SIs (*N* =20; 86.96%) said that scheduling was the biggest issue. Moreover, all the SIs were either satisfied or very satisfied with communications with the instructor, help provided by the instructor, accessibility of the instructor, designated space to conduct SI sessions, and support provided by the SI Coordinator. The only area where dissatisfaction was expressed was in the area of ongoing training. One SI did not feel the ongoing training was satisfactory. Finally, many of the SIs (*N* = 7; 30.43%) believed that the program could be improved by increased messaging – either through advertisement or encouragement by the instructor. Some thought that more space and better scheduling would improve the program (*N* = 5; 21.74%), and others thought the program could be improved by finding ways to get the SI involved (e.g., through worksheets) and introducing electronic tracking.