STEM Supplemental Instruction Effectiveness Report Summer 2017

Introduction

The purpose of this report is to evaluate the effectiveness of Supplemental Instruction (SI). What follows are descriptive statistics and success rates for each course offered under SI in Summer 2017.

Supplemental Instruction is one just activity Citrus College has implemented with the goal of achieving these objectives. Supplemental Instruction, a form of peer-to-peer tutoring, provides regularly scheduled, informal out-of-class review sessions for students who may want additional help.

In Summer 2017 Supplemental Instruction (SI) was offered for five courses – MATH030, MATH150, MATH190, MATH191, and MATH211 – for a total of 254 students. There were 108 students that attended at least one SI session and 146 that did not attend at all.

**Table 1** Overall Course Enrollment and SI Participation

Courses	# of SI Supported Sections	Enrollment	SI Participants Count	SI Participation Rate
MATH030	2	73	38	52%
MATH150	3	90	34	38%
MATH190	1	46	16	35%
MATH191	1	25	16	64%
MATH211	1	20	4	20%
Total	8	254	108	43%

Success Rates based on SI Participation

Chi-square tests were used to examine if students who participated in supplemental instruction (SI) were more likely to be successful in MATH030, MATH150, MATH190, MATH191, and MATH211 compared to students who did not participate. Success was defined as students earning a final course grade of A, B, or C. Students earning a final course grade of D, F, FW, or W were considered unsuccessful.

Table 2 Count and Success Rates by SI Participation

| Course	Enrollment	SI Participant			Non-Participant		
		Success Count	Total	Success Rate	Success Count	Total	Success Rate
MATH030	73	21	38	55%	21	35	60%
MATH150	90	32	34	94%	40	56	71%
MATH190	46	8	16	50%	17	30	57%
MATH191	25	9	16	56%	3	9	33%
MATH211	20	3	4	75%	15	16	94%
Total	**254**	**73**	**108**	**68%**	**96**	**146**	**66%**
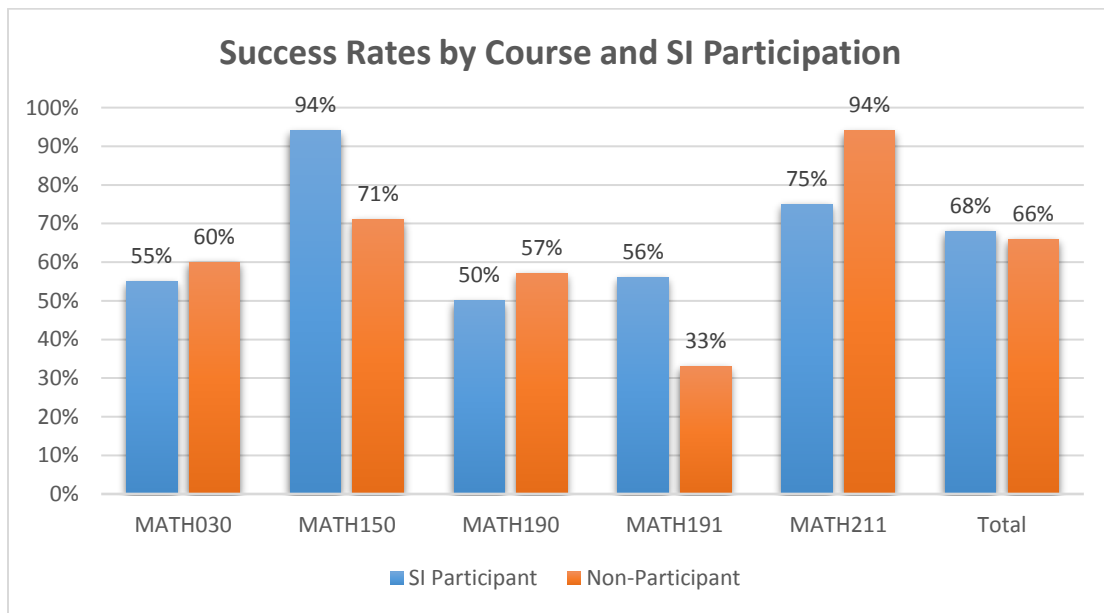
With the exception of students in MATH030, MATH190, and MATH211, students who attended Supplemental Instruction sessions had higher success rates than students who did not. The results of chi-square tests revealed the difference in success rates were statistically significant for MATH150 students only.

Success Rates Disaggregated by Dosage of SI Participation

To further compare differences among participant groups, SI participation was broken down into two categories: Low Dose (i.e. students attending 1 – 4 SI sessions) and High Dose (i.e. students attending 5 or more SI sessions). Students that did not attending any SI sessions were considered Non-SI participants.
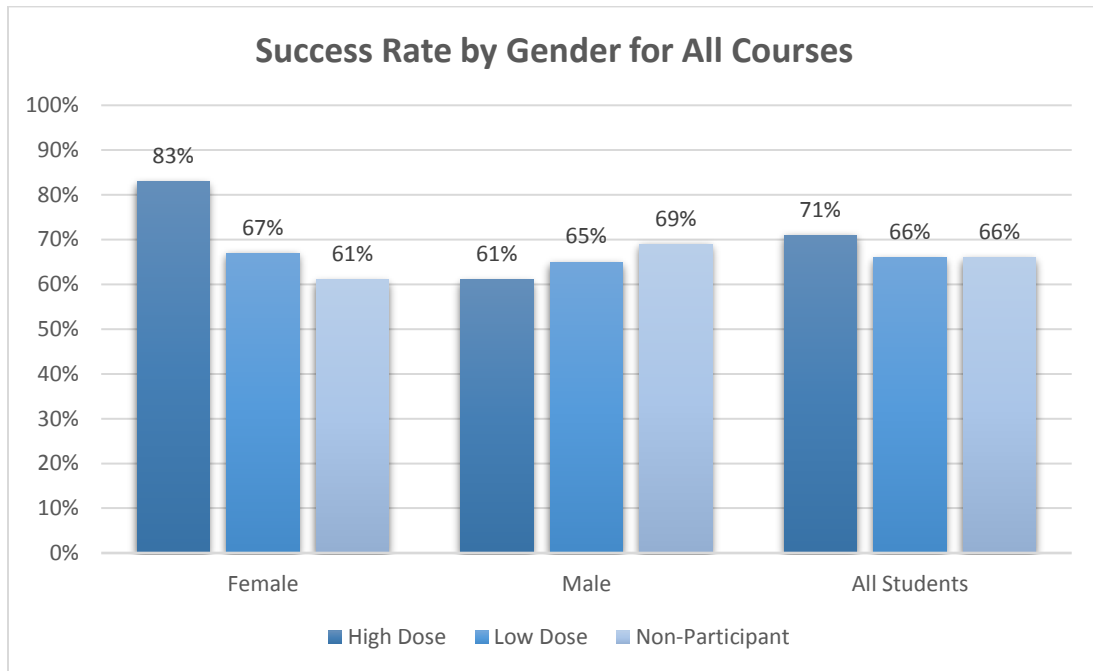
Overall, students who attended fiver or more SI sessions (i.e. High Dose participants) had the highest course success rate (71%), while students who attended 1-4 sessions and Non-SI participants had equal success rates (66%). The success rates for all courses broken down by SI dosage are shown in the figure below.
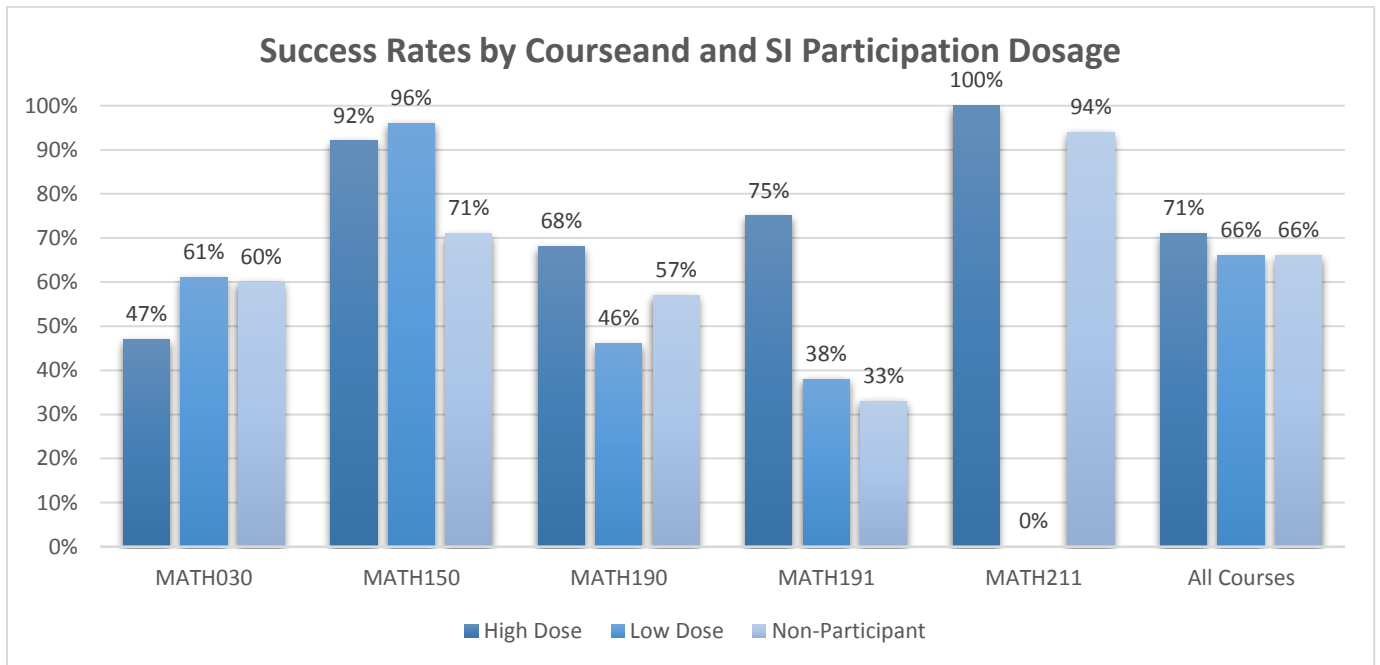
The results of several one-way ANOVA analyses (which measured success continuously using students' final course grade) revealed that the only group difference approaching significance was for MATH150 students $F(2, 90) = 2.74$, $p=.079$. Specifically Low Dose students ($M=3.05$, SD, 0.84) succeeded at a higher rate than Non-participants ($M=2.39$, $SD=1.57$), though this difference was only marginally significant ($p=.054$).
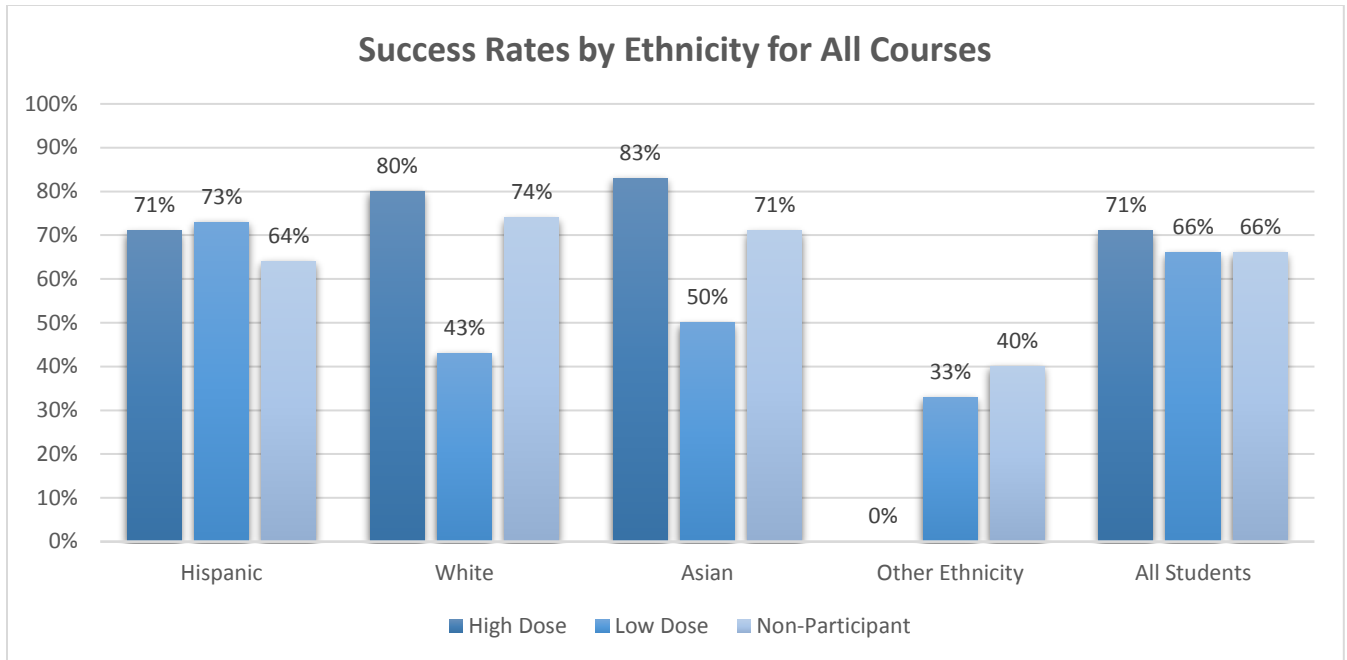
Success Rates by Demographics

The success rates for all courses broken down by gender and ethnicity are shown in Figure 2 and Figure 3.

Success Rate by Gender for All Courses

Females who attended five or more Supplemental Instruction sessions had higher success rates (83%) than those who attended fewer (67%) or did not attend at all (61%). Unexpectedly, the opposite trend was found overall for male students. As evident by one-way ANOVA analyses, the differences in these success rates were not statistically significant.

However, when the data was disaggregated by course, statistically significant differences were found between females in MATH150, $F(2, 50) = 3.29$, $p=.054$. Post hoc analyses revealed that High Dose females ($M=3.00$, $SD=0.76$) succeeded at a significantly higher rate than Non-participants ($M=1.96$, $SD=1.62$); $p=0.044$. All other group differences were not significant.

Success Rates by Ethnicity for All Courses

A grouped bar chart titled "Success Rates by Ethnicity for All Courses" showing success rates for High Dose, Low Dose, and Non-Participant groups across five ethnicity categories:

- **Hispanic**: High Dose 71%, Low Dose 73%, Non-Participant 64%
- **White**: High Dose 80%, Low Dose 43%, Non-Participant 74%
- **Asian**: High Dose 83%, Low Dose 50%, Non-Participant 71%
- **Other Ethnicity**: High Dose 0%, Low Dose 33%, Non-Participant 40%
- **All Students**: High Dose 71%, Low Dose 66%, Non-Participant 66%

Legend: High Dose, Low Dose, Non-Participant

When examining success rates across all courses by ethnicity, students who attended five or more Supplemental Instruction sessions had higher success rates overall (71%) than those who attended fewer (66%) or did not attend at all (66%). Similarly, the success rates for high dose Hispanic, White and Asian students were higher than their low dose and non-participating counterparts. The results of several one-way ANOVA analyses (which measured success continuously using students' final course grade) revealed that the differences in these success rates were not statistically significant.

However, when the data was disaggregated by course, statistically significant differences were found between Hispanic students in MATH150, $F(2, 68) = 3.51$, $p=.044$. Post hoc analyses revealed that Low Dose Hispanic students ($M=2.93$, $SD=0.70$) succeeded at a significantly higher rate than Non-participants ($M=2.12$, $SD=1.60$); $p=0.026$. All other group differences for the other four courses were not significant.

Exam Review SI Participants

Overall, 91 out of the 108 students who attended Supplemental Instruction participated in at least one exam review session, yielding a 84% Exam Review participation rate. The lowest exam review participation rate was 63% for MATH190; the highest was 97% for MATH150. Course success rates for students who attended exam review sessions are shown in the table below.

Table 3 Success Rates by Course and SI Exam Review Participation

Course	SI Exam Review Participants			Non-Exam Review Participants		
	Success Count	Total	Success Rate	Success Count	Total	Success Rate
MATH030	20	33	61%	22	40	55%
MATH150	31	33	94%	41	57	72%
MATH190	4	10	40%	21	36	58%
MATH191	9	12	75%	3	13	23%
MATH211	3	3	100%	15	17	88%
Total	**67**	**91**	**74%**	**102**	**163**	**63%**