

## Relationship of Supplemental Instruction (SI) Participation to Course Success for Fall 2016 Term

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### **Purpose of Brief**

This brief analyzes the relationship of SI participation to course success for students in specified sections during the fall 2016 term.

### **Summary of Findings**

- Students who attended one or more SI sessions were substantially ( $ES=.32$ ) and statistically significantly ( $p<.001$ ) more likely to successfully complete the course (75%) than students in the same section who did not attend any SI sessions (60%).
- Hispanic students who attended two or more SI sessions were substantially ( $ES = .38$ ) and statistically significantly ( $p = .007$ ) more likely to successfully complete the course (75%) than Hispanic students in the same section who did not attend any SI sessions (57%).
- Students 20-24 years old who attended two or more SI sessions were also substantially ( $ES = .49$ ) and statistically significantly ( $p <.001$ ) more likely to successfully complete the course (79%) than students 20-24 years old in the same section who did not attend any SI sessions (55%).

### **Overview**

As a part of the Title V Transfer Prep Grant, Crafton Hills College (CHC) developed a supplemental instruction (SI) program as an alternative learning strategy. During the fall 2016 term, CHC offered supplemental instruction for and received evaluations from students enrolled in the following course sections: CD-105-15, CD-105-25, CHEM-150-20, CHEM-150-21, CSCI-110-10, ENGL-101-20, ENGL-101-31, ENGL-102-35, ENGL-102-45, GEOL-100-25, GEOL-100-30, GEOL-101-30, MATH-103-50, PSYCH-100-60, PSYCH-100-91, SPAN-101-10, SPAN-101-30 and SPAN-102-05. This brief analyzes the relationship of SI participation to course success for students in those sections during the fall 2016 term.

### **Methodology**

The success (a grade of A, B, C or P) of students who utilized SI was compared to students with a grade on record (a grade of A, B, C, D, F, P, NP, W or I) in the same section who did not utilize SI. Additionally, success rates were also compared between students who attended one or more SI sessions and those who attended two or more SI sessions. Results were disaggregated by ethnicity, gender, and age categories to illustrate success among certain groups and categories of students. There were student identification numbers that did not match school records due to invalidity, which were excluded, therefore a limitation may be that more students attended SI sessions but were not included for analysis. Finally, analysis of variance tests and effect size calculated using Cohen's d methodology were used to measure the strength and relationship of SI success in the course and grade points earned.

The effect size (ES) statistic is commonly used in meta-analyses. A meta-analysis uses quantitative techniques to determine the average effect of a given technique over multiple studies. Noticing that even small differences can be statistically significant when large pools of data are analyzed, Jacob Cohen developed one method of interpreting effect size. Cohen defined "small," "medium," and "large" effect sizes and explained that an effect size of .20 can be considered small, an effect size of .50 can be considered medium, and an effect size of .80 can be considered large. Effect size is calculated by dividing the difference of the two means by the pooled standard deviation. It is important to mention that the number of students in each group does not influence effect size; whereas, when statistical significance is calculated, the number of students in each group does influence the significance level (i.e., "p" value being less than .05). Accordingly, using Cohen as a guide, a substantial effect would be .20 or higher.

## Findings

Table 1 illustrates the participation rate (%) of students participating in SI (#) as a percentage of total students in the same sections with a grade on record (N). Two-hundred thirty-four students (51%) of 457 students attended at least one SI session.

**Table 1: Participation rate of students in SI program.**

Course	#	N	%
CD-105-15	20	38	52.6
CD-105-25	14	29	48.3
CHEM-150-20	9	23	39.1
CHEM-150-21	7	24	29.2
CSCI-110-10	18	20	90.0
ENGLISH-101-20	8	25	32.0
ENGLISH-101-31	12	24	50.0
ENGLISH-102-35	14	25	56.0
ENGLISH-102-45	6	21	28.6
GEOL-100-25	4	17	23.5
GEOL-100-30	18	20	90.0
GEOL-101-30	2	2	100.0
MATH-103-50	9	25	36.0
PSYCH-100-60	27	37	73.0
PSYCH-100-91	24	32	75.0
SPAN-101-10	11	33	33.3
SPAN-101-30	17	30	56.7
SPAN-102-05	14	32	43.8
<b>TOTAL</b>	<b>234</b>	<b>457</b>	<b>51.2</b>

Table 2a compares the success rate of students who attended at least one SI session and those who did not attend any SI sessions. Students who attended one or more SI sessions were substantially (ES=.32) and statistically significantly ( $p < .001$ ) more likely to successfully complete the course (75%) than students in the same section who did not attend any SI sessions (60%). **There was a 15% increase in success for students who attended one or more SI sessions.**

**Table 2a: Success rates of students in course sections with SI.**

	Did not Attend Any SI Sessions			Attend One or More SI Sessions			Effect Size			p-value
	#	N	%	#	N	%	ES	Lower Bound	Upper Bound	
Successful	134	223	60.1	175	234	74.8	.32	0.13	0.50	<.001

Table 2b compares the success rate of students who attended two or more SI sessions and those who did not attend any sessions. Students who attended two or more SI sessions were substantially (ES= .39) and statistically significantly ( $p < .001$ ) more likely to successfully complete the course (78%) than students in the same section who did not attend any SI sessions (60%). **There was an 18% increase in success for students who attended two or more SI sessions.**

**Table 2b: Success rates of students in course sections with SI.**

	Did not Attend Any SI Sessions			Attend Two or More SI Sessions			Effect Size			p-value
	#	N	%	#	N	%	ES	Lower Bound	Upper Bound	
Successful	134	223	60.1	136	174	78.2	.39	.19	.59	<.001

Table 3 displays the success rate disaggregated by the students' ethnicities, genders, and age. Hispanic students who attended two or more SI sessions were substantially (ES = .38) and statistically significantly ( $p = .007$ ) more likely to successfully complete the course (75%) than Hispanic students in the same section who did not attend any SI sessions (57%). Caucasian students who attended two or more SI Sessions were substantially (ES= .48) and statistically significantly ( $p = .004$ ) more likely to successfully complete the course (83%) than Caucasian students in the same section who did not attend any SI Sessions (61%). Female students who attended two or more SI sessions were substantially (ES = .47) and statistically significantly ( $p < .001$ ) more likely to successfully complete the course (80%) than female students in the same section who did not attend any SI sessions (58%). Students 20-24 years old who attended two or more SI sessions were also substantially (ES = .49) and statistically significantly ( $p < .001$ ) more likely to successfully complete the course (79%) than students 20-24 years old in the same section who did not attend any SI sessions (55%).

**Table 3: Disaggregated student success rates.**

Success Rate by Demographic	Did Not Attend Any SI Sessions			Attended One or More SI Sessions			Attended Two or More SI Sessions			Two or More with Did Not Attend	
	#	N	%	#	N	%	#	N	%	ES	P-value
Hispanic	67	117	57.3	77	109	70.6	61	81	75.3	.38	.007
Caucasian	46	75	61.3	69	84	82.1	54	65	83.1	.48	.004
Asian	14	18	77.8	14	19	73.7	9	12	75.0	.06	.867
Multiple Races	4	7	57.1	10	15	66.7	7	9	77.8	.43	.423
African American	2	5	40.0	5	6	83.3	5	6	83.3	.86	.178
Native American/Alaskan	1	1	100.0	0	0		0	0			
Female	68	118	57.6	101	136	74.3	78	98	79.6	.47	<.001
Male	66	105	62.9	74	98	75.5	58	76	76.3	.29	.050
19 or younger	37	54	68.5	47	62	75.8	33	41	80.5	.27	.184
20-24	74	134	55.2	71	94	75.5	56	71	78.9	.49	<.001
25-29	12	18	66.7	35	50	70.0	28	39	71.8	.11	.707
30-34	3	6	50.0	9	11	81.8	7	8	87.5	.80	.169
35-39	5	6	83.3	7	7	100.0	6	6	100.0	.58	.341
40-49	3	4	75.0	3	5	60.0	3	5	60.0	.30	.681
50 and above	0	1	0.0	3	5	60.0	3	4	75.0		

Any questions regarding this report can be directed to the Office of Institutional Effectiveness, Research, and Planning at (909) 389-3331 or you may send an email to [dpineda@craftonhills.edu](mailto:dpineda@craftonhills.edu): RRNI587 FA16 Relationship of SI to Course Success.docx; FA16\_GOR\_WorkingFile\_UpdatedCourses.sav; Output\_FA16\_Relationship of SI Participation to Course Success\_Cont.spv