Crafton Hills College

Institutional Effectiveness, Research & Planning

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Research Brief

Completion and Success Rates for Spring 2013 HSI STEM Learning Community courses

Prepared by Benjamin Gamboa

Purpose of Brief

This brief illustrates the relationship of HSI STEM Grant learning communities with course completion and success in Spring 2013. Term persistence, course persistence, and course improvement will be measured at the conclusion of the next primary term, Fall 2013.

Summary of Findings

- 44% of students completing a STEM LC course were Hispanic, which is higher than the general population of Hispanics at CHC (40%).
- Hispanic students in a STEM LC course were slightly more likely to successfully complete the course (61%) than students in a stand-alone course (59%).
- Caucasian students in a STEM LC course were slightly more likely to successfully complete the course (74%) than students in a stand-alone course (73%)
- Students in a STEM LC course were less likely to complete (formally retention) the course (82%) than students in a stand-alone course (85%).
- Students in a STEM LC course (66%) were as likely to successfully complete the course as students in a stand-alone course (66%).

Overview

In response to the third deficit identified in the HSI STEM Grant (Students entering CHC have insufficient mathematics, technological and conceptual science skills), Crafton Hills College (CHC) developed a learning community (LC) program as an alternative learning strategy. LCs link together courses or coursework so students find greater coherence in what they are learning and greater interaction with faculty and peers. In the Spring 2013 term, CHC offered two LCs under the HSI STEM Grant:

- MATH-090, GEOL-100 and CHC-090
- CHEM-101 and MATH-095

Methodology

To examine the relationship between students in LCs and student performance, students in a STEM LC were compared to student in a stand-alone course taught by the same instructor in the same term, when possible. A stand-alone section of GEOL-100 was not taught in Spring 2013; subsequently, students in the GEOL-100 LC were compared to all other students enrolled in a GEOL-100 section for that term. Due to only two HSI STEM LCs being taught in Spring 2013, there are a low number of cases impacting the ability to measure statistically significant relationships and draw conclusions.

Grade on record (GOR) refers to one of the following grades: A, B, C, D, F, CR/P, NC/NP, I, or W. Course completion rate is defined as the number of A, B, C, D, F, CR/P, NC/NP, or I grades divided by the number of GOR. Success is defined as the number of A, B, C, or CR/P grades divided by the number of grades on record.

The effect size statistic is commonly used in meta-analyses and was used to indicate the size of the difference on course completion and success between those who did and did not participate in a learning community. 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

Twenty-two students completed the Geology/Math/Study Skills LC, and 30 students completed the Chemistry/Math LC.

Table 1 illustrates the number and percentage of students completing STEM LC courses by ethnic group. Forty-six percent of the students who earned a GOR in a STEM LC course were Caucasian, and 44% were Hispanics which is higher than the general population of Hispanics (40% in Spring 2013) at CHC.

Table 1: Number of students completing STEM LC by ethnicity

Ethnicity	N	%
Caucasian	58	46.0%
Hispanic	56	44.4%
African American	7	5.6%
Asian	5	4.0%
Total	126	100.0%

Note: Ethnic groups without any representation were excluded from the table.

Table 2 illustrates the overall course completion and success rates for students in STEM LC courses compared to students who earned a GOR in stand-alone courses. Students in a STEM LC course (82%) were less likely to complete the course than students in stand-alone courses (85%). Students in a STEM LC course (66%) were as likely to be successful in the course as students in stand-alone courses (66%).

Table 2: Overall course completion and success rates of students in STEM LC courses

Measurement	Stand-Alone Course			STEM Learning Community			ES	p-value
	#	N	%	#	N	%		
Course Completion	177	208	85.1%	103	126	81.7%	-0.09	0.431
Success	137	208	65.9%	83	126	65.9%	0.00	0.999

Table 3 disaggregates completion and success rates by each course for students in the STEM LC courses compared to students who earned a GOR the stand-alone courses. Students in the Geology/Math/Study Skills STEM LC were substantially more likely (ES = 0.51) to successfully complete CHC-090X4 than students in the stand-alone course. Students in the Geology/Math/Study Skills STEM LC were substantially less likely (ES < -0.15) to complete and be successful in GEOL-100 and MATH-090 than students in stand-alone courses. Students in the Chemistry/Math STEM LC were substantially more likely (ES = 0.16) to successfully complete MATH-095 and substantially less likely (ES = -0.28) to successfully complete CHEM-101 than students in stand-alone courses.

Table 3: Course completions and success rates disaggregated by course

Measurement by Course		Stand-Alone Course			STEM Learning Community			ES	p-value
		#	N	%	#	N	%		
GEOL-100	Course Completion	17	20	85.0%	17	22	77.3%	-0.19	0.533
	Success	15	20	75.0%	13	22	59.1%	-0.33	0.283
MATH-090	Course Completion	34	37	91.9%	17	22	77.3%	-0.42	0.158
	Success	26	37	70.3%	13	22	59.1%	-0.23	0.399
CHC-090X4	Course Completion	17	21	81.0%	17	22	77.3%	-0.09	0.773
	Success	10	21	47.6%	16	22	72.7%	0.51	0.097
CHEM-101	Course Completion	26	29	89.7%	26	30	86.7%	-0.09	0.728
	Success	23	29	79.3%	20	30	66.7%	-0.28	0.281
MATH-095	Course Completion	83	101	82.2%	26	30	86.7%	0.12	0.544
	Success	63	101	62.4%	21	30	70.0%	0.16	0.438

Table 4 disaggregates completion and success rates by ethnicity for students in the STEM LC courses compared to students who earned a GOR in the stand-alone courses. Hispanic and Caucasian students in a STEM LC were slightly more likely to successfully complete the courses (61% and 74%, respectively) than students in stand-alone courses (59% and 73%, respectively).

Table 4: Course completion and success rates disaggregated by ethnicity

Measurement by Ethnicity		Stand-Alone Course			STEM Learning Community			ES	p-value
		#	N	%	#	N	%		
Asian	Course Completion	6	7	85.7%	2	5	40.0%	-0.93	0.138
	Success	6	7	85.7%	2	5	40.0%	-0.93	0.138
African American	Course Completion	14	16	87.5%	4	7	57.1%	-0.72	0.181
	Success	10	16	62.5%	4	7	57.1%	-0.11	0.824
Hispanic	Course Completion	77	92	83.7%	47	56	83.9%	0.01	0.970
	Success	54	92	58.7%	34	56	60.7%	0.04	0.810
Caucasian	Course Completion	78	90	86.7%	50	58	86.2%	-0.01	0.937
	Success	66	90	73.3%	43	58	74.1%	0.02	0.914

Any questions regarding this brief can be directed to the Office of Institutional Effectiveness, Research, and Planning at (909) 389-3390 or you may send an email to bgamboa@craftonhills.edu: Research_Brief_665.docx; Grades_CHC_GOR_20130625_1213_STEM_LC-flags.sav.