



**Title V Regional HSI Grant
Activity I, Supplemental Instruction Report
Executive Summary
Spring 2004 – Spring 2007**

The US Department of Education awarded a Title V HSI (Hispanic Serving Institutions) grant of \$3 million to California State University, Stanislaus, Merced College, and Modesto Junior College. Funded in October 2003, the project was conceived, proposed, and supported by The Higher Education Consortium of Central California (HECCC).

The grant's primary focus is two fold - increase student success in mathematics and math dependent courses through the implementation of SI (Activity I - Supplemental Instruction) and increase the number of students who transfer from community colleges to a university (Activity II – STAMP program). As part of the activities supported through the grant, the three institutions have been given the ability to facilitate related regional research. The following are a summary of the data collected from the three institutions and aggregated at the conclusion of the fourth year of the grant activities, 2006-07.

Activity One – Goal – “To increase student success in mathematics and math dependent courses.”

Over the three and one-half years (seven semesters) of the Title V Regional Grant's Activity One, SI services were offered to all enrolled students of selected SI courses beginning the Spring 2004 and continuing to Spring 2007. During this time a total of 169 course sections with 7,031 enrolled students were selected to receive Activity One's Supplemental Instruction (SI) services. Of those, 2,734 (38.9%) chose to participate in the SI activities and those activities were led by 155 trained SI leaders. A total of 6,416 SI sessions were conducted over the four year period consisting of 18,762 student contacts hours (see chart, p.4).

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Activity One – Increase student success in mathematics and math dependent courses, 2004 – 2007

A **significant finding** was the successful **increase in efficiency and effectiveness** of SI activities over the past three and one-half years. Student participation in SI services increased while the numbers of veteran SI leaders returning from previous years served more students and nearly doubled the number of student contacts over years from Spring 2004 to Spring 2007.

Comparing the three and one-half academic years from Spring 2004 to Spring 2007, the operational statistics were:

- **Students Served:** **2,734** students participated in SI;
- **Efficiency:** On average, **17.7** SI participants were served per SI leader;
- **Participation:** **18,762** student contact hours were facilitated by 155 SI leaders over the four year period.

Activity One – Successful Course Completion

Successful performance in algebra, economics, chemistry, human anatomy, (biology and accounting courses were added in 2006-07) was measured in terms of students earning grades of C or better. When the groups of non-participating students were compared with SI participants, the SI participants consistently completed their courses in higher success ratios than their non-participant classmates across all semesters and academic years.

- **57.2%** 1,564 of 2,734 SI participants successfully completed courses with a grade of C or better as compared to 47.1% in the numbers of successful non-participants (see chart, p.5).
- **12.5%** fewer SI participants ($812/2,734=29.7\%$) received failing or W grades than non-participants ($1,815/4,297=42.2\%$).

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Activity Two - Goal – “Increase the number of students who transfer from community colleges to a university”

Program performance was measured in the number of students who participated and persisted from fall term to fall term and by the numbers of successfully transferred community college participants to a university and/or baccalaureate degrees.

- **320** Students in four cohorts participated in the three and one-half years of the grant (see p.11); and
- **79%** of those students persisted from fall to fall terms at the **community colleges**, and/or were transferred to a university (This compared to a baseline persistence rate of 72.6% persistent rate taken prior to grant activities, see p.10.)
- **50%** of the **03-04 community college** cohort participants transferred as compared to 29.6% statewide transfer rate as reported through the California Community College Chancellor’s Office, SRTK 2002 Cohort transfer rate data (see p.13).
- **94%** of the **CSU Stanislaus transfer students** have persisted toward, or earned their baccalaureate degrees as of Fall 2007 (see p.8).
- **115** students transferred to universities of which **67 transferred to and enrolled with CSU Stanislaus** – 6 students are confirmed baccalaureate degree graduates and another 13 have applied for graduation in the next academic year (see p.8).

The following pages summarize the data from each activity by individual year, and in some cases by term. For questions related to this report or for information requests, please contact the Title V Regional Office, (209) 667-3897.

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Activity One – Increase student success in mathematics and math dependent courses, 2004 – 2007

Activity One – Operational Statistics by Academic Year and Institution, Spring 2004 to Spring 2007

	Grand totals	Totals				CSU Stanislaus				Merced				MJC			
		Spr 04	04-05	05-06	06-07	Spr 04	04-05	05-06	06-07	Spr 04	04-05	05-06	06-07	Spr 04	04-05	05-06	06-07
SI targeted course sections	169	16	49	45	59	4	23	15	18	4	12	12	17	8	14	18	24
No. SI leaders (unduplicated)	155	14	53	37	51	4	18	10	18	4	14	10	16	6	21	17	17
Graded enrollment of targeted sections	7,031	800	1623	2085	2523	242	729	777	868	113	390	456	780	445	504	852	875
No. of students who participated in SI	2,734	268	527	849	1090	43	211	308	422	50	127	199	371	175	189	342	297
Number of SI sessions offered	6,416	470	1593	1990	2363	60	388	292	428	131	473	655	775	279	732	1043	1160
Total SI contact hours	18,762	1464	3677	5960	7661	112	942	1195	2138	240	1217	2054	2859	1112	1518	2711	2664

	Efficiency per SI participant served							
	Total		CSU Stanislaus		Merced		MJC	
SI participation per:	#	Mean	#	Mean	#	Mean	#	Mean
No. students per SI leader	2,734/155	17.7	984/50	19.7	747/44	11.0	1,003/61	16.43
SI sessions by SI participants	6,416/2,734	2.3	1,168/984	1.2	2,034/747	2.7	3,214/1,003	3.2
SI hours by SI participants	18,762/2,734	6.9	4,387/984	4.5	6,370/747	8.5	8,005/1,003	8.0

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Activity One – Successful Completion in All SI Courses

For each academic year and overall, SI participants consistently earned passing grades in higher ratios than their non-SI participating classmates. Overall semesters and years, 57.2% SI earned passing grades compared to 47.1% Non-SI enrolled in the same courses.

Successful Course Completions by Year - SI, Non-SI Participants

	% Successful	Total Successful	Spring 2004 Successful Grades			2004-05 Successful Grades			2005-06 Successful Grades			2006-07 Successful Grades		
			A	B	C-CR	A	B	C-CR	A	B	C-CR	A	B	C-CR
All (7,031)	51.0%	3,586	83	128	193	172	312	398	168	341	503	245	417	626
SI (2,734)	57.2%	1,564	24	59	58	48	122	148	81	145	227	131	210	311
Non-SI (4,297)	47.1%	2,022	59	69	135	124	190	250	87	196	276	114	207	315

Activity One – Successful Completion of Math (Algebra) Courses

Performance Indicator #1.a of the Title V grant (p. 51) states that *the percent of students who complete math remediation will increase by 5% during the first year of the project.*

As the performance standard is written, a 5% increase in success for math students would represent a 51.8% success rate at the end of the grant's first year (based on statistics reported prior to the grant, Spring 2003, and the pre-collegiate math averaged successful completion rate of 48.9% for MJC and 49.9% for Merced¹). Over the six semester period, the SI students exceeded the goal in all but the Spring 2005 semester. As mentioned above, they out performed their non SI participants in every year and across all semesters.

¹ Per California Community College Chancellor's Office, *Program Retention/Success Rates For Enrollments By Distance Education Status*, queried: 8/8/2007 at CCCCO "DataMart": http://misweb.cccco.edu/mis/onlinestat/ret_sucs_de.cfm.

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Activity One – Successful Completion of Math (Algebra) Courses (continued)

Math SI Targeted Courses (Algebra) - Successful Course Completions, Fall 2004 – Spring 2007

	SI Algebra Courses Fall 2004			SI Algebra Courses Spring 2005			SI Algebra Courses Fall 2005			SI Algebra Courses Spring 2006			SI Algebra Courses Fall 2006			SI Algebra Courses Spring 2007		
	Success ABC	Total N	%	Success ABC	Total Enr. Algebra	%	Success ABC	Total Enr. Algebra	%	Success ABC	Total Enr. Algebra	%	Success ABC	Total Enr. Algebra	%	Success ABC	Total Enr. Algebra	%
All:	478	899	53.2%	304	760	40.0%	305	661	46.1%	492	938	52.5%	335	687	48.8%	431	934	46.1%
SI	150	261	57.5%	132	306	43.1%	141	281	50.2%	207	356	58.1%	177	311	56.9%	175	337	51.9%
Non-SI	328	638	51.4%	172	454	37.9%	164	380	43.2%	285	582	48.9%	158	376	42.0%	256	597	42.9%
+/- Gain			+6.1%	+5.2%			+7.0%			+9.2%			+14.9%			+9.0%		

* Per HSI Title V grant definitions, “Success ABC” is defined as students who remain in, and successfully complete an algebra course with a grade of A, B, C-CR.

Grade Distribution by Academic Year SI and Non-SI Participants

		Grade Distribution										Total	
		F,NC,W,WU		D		C, CR		B		A		Successful	
Academic Year:		Count	%	Count	%	Count	%	Count	%	Count	%	C-CR,B,A by Total	%
Non-SI	03-04	218	12.0%	51	11.1%	135	13.8%	69	10.4%	59	15.4%	263/532	49.4%
	04-05	427	23.5%	105	22.8%	250	25.6%	190	28.7%	124	32.3%	564/1096	51.5%
	05-06	542	29.9%	135	29.3%	276	28.3%	196	29.6%	87	22.7%	559/1236	45.2%
	06-07	628	34.6%	169	36.7%	315	32.3%	207	31.3%	114	29.7%	636/1433	44.4%
	Total	1815	100.0%	460	100.0%	976	100.0%	662	100.0%	384	100.0%	2022/4297	47.1%
SI	03-04	97	11.9%	30	8.4%	58	7.8%	59	11.0%	24	8.5%	141/268	52.6%
	04-05	154	19.0%	55	15.4%	148	19.9%	122	22.8%	48	16.9%	318/527	60.3%
	05-06	275	33.9%	121	33.8%	227	30.5%	145	27.1%	81	28.5%	453/849	53.3%
	06-07	286	35.2%	152	42.5%	311	41.8%	210	39.2%	131	46.1%	652/1090	59.8%
	Total	812	100.0%	358	100.0%	744	100.0%	536	100.0%	284	100.0%	1564/2734	57.2%



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Activity Two – Reducing Inter-institutional Barriers to Transfer

Activity Two Program Objective: Reduce inter-institutional barriers that inhibit student success and transfer to the university.

Activity Two Program Description

The Title V Activity Two program (STAMP) is designed to increase the transfer rates of community college students enrolled Merced College and Modesto Junior College to the university level. Community college STAMP participants are recruited from students who are first-generation, full-time, degree seeking, transfer-bound college Hispanic students and/or low-income, and those who have enrolled in an intermediate algebra course, and declared a goal of transfer to a four-year university. They are provided individualized services that can include, but are not limited to, mentoring, workshops, special events and tours, and celebrations of student and mentor success. Once transferred to CSU Stanislaus, the STAMP program continues to facilitate and track participants to graduation and a baccalaureate degree.

The program's research component at the community colleges tracks each student's progress through retention and persistence to transfer and a baccalaureate degree. Upon transfer to and enrollment in the university, participants are further monitored and tracked through their progress toward, and earning baccalaureate degrees. Each cohorts' activities are summarized and the data reported in annual Title V Regional Reports.

Activity Two – Total Participants Served and Progress Status – Community Colleges

As of the 2006-07 academic year and the conclusion of the Title V HSI grant's fourth year, 307 students have participated in STAMP at the community colleges. By October 2007, 82.7% of the program participants were either continuing, transferred or had completed 56 transfer credit units, or were "transfer prepared" (see p.10).

Activity Two – Total Participants Served and Progress Status – CSU Stanislaus

A total of 98 Activity II (STAMP) students transferred to a university from the community colleges. Of those, 90 STAMP students transferred to CSU Stanislaus, and of those, 64 continued their participation in the CSU Stanislaus STAMP program (see p.7). The CSU Stanislaus Activity Two program employs an average of 8 CSU Stanislaus mentors per year.

Baccalaureate Degrees

By the end of the summer 2007, 19 STAMP participants had applied for graduation and 12 of those were awarded baccalaureate degrees. Two of the program participants graduated with honors and were continuing in master's degree programs (see p. 9).

Note: Many of the students who have enrolled at the university level will still be working toward their baccalaureate degrees after the final report and termination of the grant, summer of 2008.

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For the fourth year of the grant, and the eighth semester for the Activity Two program, progress toward program goals exceeded expectations in persistence and actual transfers; however, data are still being collected and are considered preliminary until the final report is produced—at the conclusion of the grant period (2008). The CSU Stanislaus Activity Two averages 8 mentors per year.

Activity Two - CSU Stanislaus University, numbers of baccalaureate-seeking participants

The majority of students who transferred to, and participated in the university's Title V, Activity Two program were retained and continued toward a baccalaureate degrees. Students who finished their general education requirements at the community colleges and successfully transferred to the university, and the current number of participants who have applied for, or earned baccalaureate degrees are summarized as follows per each academic year:

	Activity Two Participants - CSU Stanislaus						
	Retention				Expected Baccalaureate Graduations		Actual Baccalaureate Graduations
	1.	2.	3.	4.	5.	6.	7.
Academic Year	Title V Transfers from CCs to CSU Stanislaus*	Title V Transfers Continuing in Activity Two program CSU Stanislaus	STAMP Persisted toward baccalaureate or graduated C.3 / C.2	Persisted toward baccalaureate graduation %	Expected to Graduate by Year	Applied to Graduate by Year	Confirmed Graduates by Year**
Spring 2004	2	1	1 / 1	100%	0	0	0
2004-05	8	11	8 / 11	72.7%	0	0	0
2005-06	29	22	22 / 22	100%	3	2	2
2006-07	31	16	15 / 16	93.5%	14	8	8
2007-08 (incomplete)	20	14	14 / 14	100%	20	7	2
2008-09 (TBA)					19	2	TBA
2009-10 (TBA)					8	TBA	TBA
Totals	90	64	60 / 64	93.7%	64	19	12

* A total of 90 Title V participants transferred from the community college Title V programs to CSU Stanislaus by Fall 2007. Not all chose to continue in the Activity Two program at the university (see column 2).

** At the time these data were collected the “actual” graduate numbers were still being updated to the CSU Stanislaus Title V Regional database.

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Activity II - Longitudinal progress toward graduation per STAMP cohort

The goal of the STAMP program is to assist students in completing their transfer requirements, to matriculate to the university, and to ultimately graduate with a baccalaureate degree or higher. Students begin the program in a cohort and as a group, but because they arrive with varying academic levels, they may transfer and/or graduate at different times and academic years. It is also reasonable to assume that a student who begins the program in any given year may not be ready to transfer within a specified timeframe for a variety of reasons not related to academic achievement. The following chart is an attempt to display that variance in, and longitudinal progress of each of the STAMP cohorts.

Enrollment, Transfer and Expected Graduation by Academic Year

Cohort ² Progress as of Summer 2007:	Community Colleges			Participants in STAMP Program, CSU Stanislaus	Expected or have applied to graduate CSU Stanislaus, by academic year						
	Number in Cohort	Still Active and Enrolled at CC ³	Transferred, Any University		2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Exited Program
Cohort 03-04	66	26	27	25	N/A	1	5	7	8	3	1
Cohort 04-05	107	37	52	29	N/A	N/A	3	4	9	10	3
Cohort 05-06	80	43	15	7	N/A	N/A	N/A	1	2	4	0
Cohort 06-07	54	51	3	1	N/A	N/A	N/A	N/A	0	1	0
Cohort 07-08	TBA	TBA	TBA	2	N/A	N/A	N/A	N/A	N/A	1	0
Totals	307	157 ⁴	97	64	0	2	8	12	19	19	4

- One student from the 03-04 and one from the 04-05 cohorts continue to pursue their Master's degrees at CSU Stanislaus, and two more graduated with honors.
- Current numbers of graduations and applicants for graduation can be found on the previous chart, p. 8.

² Cohort year is the reported cohort from the community colleges.

³ Also see: Total Participant Persistence by Cohort and Year, 2003-2007 (Community Colleges), p. 10.

⁴ Includes the persisting students plus those who have completed 56 transfer units (see p. 10).

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Activity Two – Community Colleges, gain or loss in persistence ratios as compared to Community Colleges’ general population baseline data (Fall 2003)

Students participating in the Activity Two programs persisted to, and enrolled in subsequent academic terms at **80%** on average (see next page). The Fall 2003 persistence ratio for the general community of the two community colleges for first-time, full-time, degree-seeking students averaged just under **73%***. This represents an increase in program retention and persistence for STAMP participants overall as compared to the general population.

Activity Two – Persistence 2003-2007 (Community Colleges)

Community Colleges							
Merced College				Modesto Junior College			
General Population* Persistence Fall 2003	Cumulative Persistence Fall 2004-Fall 2007	Persistence %	Gain / Loss (+ / -)	General Population* Persistence Fall 2003	Cumulative Persistence Fall 2004-Fall 2007	Persistence %	Gain / Loss (+ / -)
75.0%	105/135 ⁵	75.6%	+.6%	70.1%	151/174	86.8%	+16.7%

- * General Population baseline persistence ratios include: first-time, full-time, degree-seeking students enrolled in Fall 2003 term and returning to Fall 2005. (Persistence is defined as students who enroll in a fall term and “persist” to the following fall term.)
- * Baseline general population data supplied by MJC Research Office and YCCD Information Office. Issues with the data include student application data that may, or may not have been updated at the time of data collection based on the student’s initial application submission. Due to this and the difficulty in matching cohort student records during a database conversion during the same period of the study, some distortion may exist in the general population persistence ratio for MJC, Fall 2003.
- * Baseline general population data supplied by Merced Community College Research Office included student application data that may have, or may not have been updated during the time of collection based on the student’s initial application submission. Therefore, some distortion may also be present in the baseline data for Merced in terms of the general population persistence ratio for Fall 2003.
- * The Title V cohort data was independent of the general college population databases, thus not affected by the issues stated above.
- **Though transferred students from a cohort may not enroll at CSU Stanislaus, they are counted for this report as successfully persisted.

⁵ During Merced’s Activity Two cohort year of 2004-05, approximately 19 students were removed from the database due to ineligibility to participate, e.g., non transfer goals, etc. These students have been filtered from the data. It is highly likely some of these participants may still be counted as part of the eligible group due to insufficient information.

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Total Participant Persistence by Cohort and Year, 2003-2007 (Community Colleges)

Of the 307 students served by the two community colleges over the first three years of the grant, 254 (82.7%) persisted in the Activity Two program or were known to have transferred. Some students may have exited the program without notifying the colleges of their transfer destination.

		Community Colleges							
		Merced College				MJC			
	Total	Cohort 1 03-04	Cohort 2 04-05 ⁶	Cohort 3 05-06	Cohort 4 06-07	Cohort 1 03-04	Cohort 2 04-05	Cohort 3 05-06	Cohort 4 06-07
Cohort number	307	23	66	30	14	43	41	50	40
Number persisting (fall to fall)	139	3	8	9	10	17	21	34	37
Number of transfers*	97	13	43	11	1	14	9	4	2
Number completed 56 transfer units	18	1	2	2	-	5	6	2	-
Percent persisted (continuing + transferred)**	82.7%	73.9%	80.3%	73.3%	78.6%	83.7%	87.8%	80.0%	97.5%

The following ratios are compared in the table below to the STAMP student participants using the same cohort criteria as the SRTK data summaries. As of July 2007, Cohorts #1 and #2 for both colleges surpassed the statewide, as well as their individual colleges' SRTK transfer ratios. A row depicting students who were not known to have transferred, but had completed 56 or more transferable credit units was added to indicate "transfer-prepared" and to be consistent with the CCCCCO SRTK transfer ratio calculations (see next page).

⁶ During Merced's Activity Two cohort year of 2004-05, approximately 19 students were admitted into the program who were later found to be ineligible to participate, e.g., non transfer goals, etc. These students have been filtered from the data and are not reflected in this report.

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Comparison of Activity Two STAMP Transfer Ratios to California Statewide Student Right to Know (SRTK) Student Transfer Ratios

Another way to look at the program's success in transferring program participants is to compare those published SRTK transfer ratios provided by the state's California Community College Chancellor's Office (CCCCO). As of July 2007, there was difference in transfer rates for the STAMP participants as compared to the latest 2002 cohort data from the CCCCCO (reprinted below the following chart).

A fair comparison of transfer rates can be provided by viewing the 03-04 STAMP participant cohorts to the CCCCCO cohort who are selected on much the same criteria as the program participants. With the added exception of economic status, STAMP participants were first-time, full-time and "transfer directed" as is the criteria for the CCCCCO data. For Merced College and MJC, a significant increase over the state transfer rate is evident. Combined, the two colleges transferred **50%** of their 03-04 cohort exceeding **the statewide transfer rate of 29.6% by 20.4%**.

Note: Though the current transfer numbers are reported for 05-06 and 06-07 and overall, the reader should keep in mind that the majority of these last cohort participants will still be working on transfer requirements at the conclusion of the Title V HSI Regional Grant's final Annual Report in Summer of 2008.

Community College STAMP Participant Transfer Ratios by Cohort

	Overall 03-04 Cohorts	Merced College 2002 Baseline: 22.0%				MJC 2002 Baseline 27.5%			
		Cohort 1 03-04	Cohort 2 04-05	Cohort 3 05-06	Cohort 4 06-07	Cohort 1 03-04	Cohort 2 04-05	Cohort 3 05-06	Cohort 4 06-07
Cohort number	66	23	79	30	14	43	41	50	40
Number of actual transfers ⁷	27	13	44	11	1	14	9	4	2
Number of students not transferred with 56 transferable credit units*	6	1	3	2	-	5	6	2	-
Percent Transferred by Cohort	50.0%	60.9%	59.5%	TBA	TBA	44.2%	36.6%	TBA	TBA

* Transfer numbers for the STAMP cohorts include those students who were actual transfers to a university as well as those who completed 56 transferable units with a GPA of 2.0 or better (per published CCCCCO SRTK criteria). The ratios for all "transfer-identified" community college students as reported by the California Community College Chancellor's Office using similar data for denominators and numerators are:

Merced College SRTK Transfer Rate, 2002 Cohort:	<u>22.0%</u>
Modesto Junior College SRTK Transfer Rate, 2002 Cohort:	<u>27.5%</u>
Statewide SRTK Transfer Rate, 2002 Cohort:	<u>29.6%</u>

⁷ California Community College Chancellor's Office, accessed 4/2/2007. Student Right to Know (SRTK) data for most recent cohort analysis (Fall 2002). Available: <http://www.cccco.edu/divisions/tris/mis/srtk.htm>.



**Title V Regional Grant
Supplemental Instruction
Report on a Preliminary Quantitative Analysis of the
Effect of Student Participation in SI Sessions to the
Final Grade Received in the Course
Spring 2005 – Spring 2006**

This report reflects the results from a preliminary data analysis collected from 2,431 individual student records at the mid-point of a five-year Title V grant awarded to CSU Stanislaus, Merced College and Modesto Junior College. The study's objective was to statistically measure the effect of Supplemental Instruction (SI) on final grade based on students' entering skill level (test scores at the start of the course), and the number of SI sessions attended during the term.

In the grant's subject areas of algebra, chemistry, economics and human anatomy, students who opted to participate in SI typically averaged lower initial test scores while earning slightly higher average GPAs. Therefore it was assumed that the number of SI sessions attended had an effect on grades for students enrolled in these courses. The hypothesis was that a positive and significant relationship existed between the number of SI sessions attended and the final grade received. (Student were identified as SI participants if they attended one or more SI sessions.)

Executive Summary

These preliminary results indicate that at the mid-point of the five year grant, SI was having a positive, and significant effect on final grades as evidenced by attendance in SI sessions. Data showed that, on average, SI participants had slightly lower first of term initial test scores as compared to non-SI participants yet succeeded in higher ratios and with slightly higher mean GPAs. (Table 1, p.4).

Furthermore, a statistically significant difference existed between the two student groups of SI participants and non-SI participants who received non-passing scores on their initial term tests (below 70 percent). SI participants earned higher mean GPAs than the non-participants. The group of students who attended three or more sessions realized the greatest gain in mean GPA. (Table 2, p.5).

Grade distributions across the two groups reflected that SI participants had fewer withdrawal and incomplete grades (W, I), and failed grades (F, NC) than the non-participants. (Tables 4-5, p.6).

Conclusion

At the mid-point of the grant's life, these preliminary comparisons found a statistically significant difference between groups of SI and non-SI participants in mathematics, chemistry, economics and human anatomy courses. The effect was more pronounced for those attending three or more SI sessions during the term and for students who scored below passing on their initial test at the beginning of the course.

Introduction

The research outcomes that follow involve two groups' of student data—those of SI participants, students who attended at least one SI session or more during the course, and of non-SI participants who attended no SI sessions. The data were taken from student records collected from the three institutions of CSU Stanislaus, Merced College, and Modesto Junior College over the span of three semesters, Spring 2005, Fall 2005 and Spring 2006. The grant designated algebra, chemistry, economics and human anatomy as the courses to offer SI services. The course sections were selected by the administration at each institution.

Data were collected from the Title V, HSI regional grant SI-targeted courses involving high-risk courses of Algebra, Chemistry, Economics and Human Anatomy. Each student enrolled in the SI (Supplemental Instruction) identified course had their first-of-term initial test scores, final grades and each SI session attended, if any, recorded. The student records were collected and aggregated from the three institutions of the Title V regional grant: CSU Stanislaus, Merced College and Modesto Junior College.

The data collection was reviewed and differences between groups tested for goodness of fit (Chi-square and ANOVA¹). A regression analysis was selected to be performed on two levels: The dependent variable was selected as the final grade in the course and was coded from “0” for withdrawals and incomplete grades to “1” for grades of F, “2” for grades of D, “3” for C or CR, “4” for B, and “5” for A grades. The independent variables were initial test scores and the total number of SI sessions attended during the term. All courses in the study were aggregated with no distinction between institutions, subjects, or instructors.

Using the categorical groups of participants/non-participants, the count totaled 2,431 records of which 1,012 were SI participants² and 1,419 were non-SI participants. Of these, 474 SI participants did not pass (scored below 70%) their initial test and 639 non-SI participants did not pass their initial test. This created four distinct groups—SI participants and Non-SI participants, and those who passed and those who did not pass their first of term test in the course.

Sub levels were then added to create ranges of SI sessions attended. The model was then tested for significance at all stages of the analysis at the .05 and .01 levels. The correlations that follow were all significant, many at the .000 level by group and by sub levels. Each of the six steps' results are reprinted in Tables 1 through 7 that follow on pages 4 through 7.

Results

It should be noted that all correlations reported fell well within the .01 to .05 significance level or better—meaning the quantified results reflect a difference between groups that is highly unlikely to occur by error or chance.

¹ The results of the ANOVA analysis of variance on both groups—SI participants and non-SI participants—were all below the .01 to .05 level, meaning there was less than a 100 to 1 chance that the difference between groups was a result of chance or error with nearly all at the .000 level, meaning a 1000 to 1 chance of error.

² An SI participant is defined as any enrolled student who attended at least one SI session during the term.

Analysis, Step 1: The result of the first regression analysis indicated that based on a student's initial test score and attendance in Supplemental Instruction sessions over the period of Spring 2005 to Spring 2006, SI had a positive effect on final grades. The coefficient for SI participants of .578R was statistically significant at the .000 level. Non-SI students correlated somewhat lower at .524R that was also significant at the .000 level. (Table 1, p.4)

Analysis, Step 2: With an overall average initial test score of 69.63 at the beginning of the term, and a grade mean of 1.403 (recoded to a 5 point scale), the next step was to determine the extent of influence on grades by SI attendance. It was known from previous semester and annual reports that the average GPAs and course completions for SI students were somewhat higher than Non-SI participants. It was also known that SI participants scored somewhat lower on their initial test scores on average than their Non-SI classmates (69.35 for SI compared to 69.83 for non-participants).

By the end of the terms and though they started the term with lower mean test scores, SI participants were earning slightly higher mean course grades as compared to their Non-SI classmates (1.52 for SI compared to 1.32 for non-participants). Given the inverse relationship of lower test scores to higher grades for SI participants, it was presumed that the effect was due to the number of SI sessions attended. (Table 1, p.4)

Analysis Step, 3: The next step was to compare the SI group by attendance to final grade using the same model. The data showed that the strongest effect on final grade was evidenced for students who attended six or more SI sessions during the term. The correlation coefficient for SI participants having 6 to 10 sessions was .705R, at the .000 significance level. (Table 1, p.4)

Analysis, Step, 4: The data were further parsed to separate the students who scored below 70 percent on the first test and those who scored a passing or above passing score as well as by SI and Non-SI groups. Mean GPAs were higher for the SI students for both test score groups as well as consistent with the previous step with the mean GPAs and correlation coefficients showing a positive and moderate to strong relationship to SI attendance. (Tables 2-3, p.5)

Analysis, Step 5: The next question involved a like analysis but further reduced to individual grade levels. This analysis provided an understanding of SI's effect by each individual grade level. The same analysis model was continued per grade. The data show that proportionally, more SI students failed the initial test but earned passing grades, with the bulk primarily centered in the "C" grade category. Proportionally there were considerably fewer failing grades and withdrawals for SI participants than Non-SI participants. (Tables 4-5, p.6)

Analysis, Step 6: The final step was to compare SI grade levels by the number of SI sessions attended. The ratio of successful course completions (grades A, B, C, CR,) progressively increased with each of the grade levels according to the increase in the number of SI sessions attended. All SI sub levels were higher than those of the non-SI participant group. (Tables 6-7, p.7)

The conclusion: at the mid point of the Title V Grant Supplemental Instruction project, student attendance in SI sessions had a significant influence on final grade outcomes for courses studied.

Regression Analysis Tables

All Graded Enrollments in SI-Targeted Courses, Spring 2005, Fall 2005, Spring 2006

	All	Non-SI	SI
Mean Initial Test Score:	69.63	69.83	69.35
Mean GPA:	1.403	1.32	1.52

Number of Student Records with Initial Test Scores and a Grade:

Number of SI Participants:	1,012
Number of Non-SI Participants:	1,419
Total Students with Initial Test Scores and a Grade:	2,431

Student Records with Non-passing Initial Test Scores (Scored below 70%):

Number of SI participants (46.8% of SI)	474
Number of Non-SI participants (45.0% of Non-SI)	639
Total students with non passing initial test scores:	1,113

The following regression analysis compared students' initial test score in the course to the strength, and effect of SI attendance on final grades. The non-SI group had a slightly higher mean initial test score but slightly lower mean GPA than the SI participants. Broken out by the number of SI sessions attended, it was evident that mean GPAs increased with the number of sessions attended in the courses studied. And though the mean initial test score remained the same (with the exception of the students who attended ten or more sessions), the strength of the effect—as measured by the Pearson r coefficients—were higher with all significant at the .000 level.

Table 1. Students with an Initial Test Score and a Grade

N: 2,431	All Enrolled Students with an Initial Test Score and a Grade	Mean Test Score	Mean GPA of Group	Pearson r	Sig.
1,419	Non-SI (no SI sessions)	69.83	1.32	.524	.000
1,012	SI (1 or more SI Sessions)	69.35	1.52	.578	.000
423	SI, 1-2 Sessions	67.49	1.34	.557	.000
218	SI, 3-5 Sessions	68.40	1.48	.523	.000
165	SI, 6-10 Sessions	68.76	1.62	.705	.000
206	SI over 10 Sessions	74.64	1.84	.539	.000

The following regression analysis compared students who scored below passing on their initial course test (scored below 70 percent), by the strength of effect SI attendance had on final grade for the students who could be considered “at risk” from the beginning of the term.

Graded Enrollments in SI-Targeted Courses, Spring 2005, Fall 2005, Spring 2006

Students scoring below passing on their initial test showed improvement in their mean GPA with the number of SI sessions attended. The initial test scores for those “at risk” did not correlate as strongly to the grade outcome as did the number of SI sessions attended. Rather, as attendance in SI increased, the strength of the relationship to grade (Pearson r) increased.

Table 2. Students with Below-Passing Initial Test Scores, by SI and Non-SI

N: 1,113	With initial test scores below passing	Mean Test Score of Group	Mean GPA of Group³	Pearson r	Sig.
639	Non-SI (no SI sessions)	52.41	1.32	.403	.000
474	SI (1 or more SI Sessions)	54.26	1.55	.307	.000
221	SI, 1-2 Sessions	53.77	1.41	.221	.004
108	SI, 3-5 Sessions	54.84	1.69	.310	.005
78	SI, 6-10 Sessions	52.79	1.58	.475	.000
67	SI over 10 Sessions	56.66	1.76	.388	.005

To ensure the comparison was complete, the same comparison was performed but layered by students who passed their initial test in their courses and either attended, or did not attend SI sessions. The correlation coefficients were again higher than the Non-SI group, indicating that participation in SI sessions had a positive influence on final grade outcome for all students.

Table 3. Students with Passing Initial Test Scores, by SI and Non-SI

N: 1318	With initial test score below passing	Mean Test Score of Group	Mean GPA of Group⁴	Pearson r	Sig.
780	Non-SI (no SI sessions)	84.10	1.92	.197	.000
538	SI (1 or more SI Sessions)	82.64	2.15	.358	.000
202	SI, 1-2 Sessions	82.49	2.06	.255	.001
110	SI, 3-5 Sessions	81.71	2.02	.383	.000
87	SI, 6-10 Sessions	83.08	2.34	.324	.000
139	SI over 10 Sessions	83.31	2.24	.375	.000

³ Mean GPAs for students were coded to a five-point scale to weight the “W” grades lower than the “F” grades. Coding included: 0=W-I; 1=F-NC-WU; 2=D; 3=C-CR; 4=B; and 5=A grades.

⁴ Mean GPAs for students were coded to a five-point scale to weight the “W” grades lower than the “F” grades. Coding included: 0=W-I; 1=F-NC-WU; 2=D; 3=C-CR; 4=B; and 5=A grades.

Table 4. Grade Distribution of all students who enrolled in an SI-identified course with an Initial Test Score and Grade, compared to SI to Non-SI participants, and by “passed,” or “did not pass” the initial test in the course.

Grades	Group:		Passed Initial Test (70% or Above)			Did Not Pass Initial Test (Below 70%)		
			Non-SI	SI	N:1318	Non-SI	SI	N: 1113
	Total N:		N: 780	N: 538		N: 639	N: 474	
			59.2	40.8	100	57.4	42.6	100
		Count	96	39	135	185	129	314
	W or I	% of Group	12.3	7.2		29.0	27.2	
		% Total	7.3	2.9	10.2	16.6	11.6	28.2
		Count	89	47	136	237	126	363
	F or NC	% of Group	11.4	8.7		31.7	26.6	
		% Total	6.7	3.6	10.3	21.3	11.3	32.6
		Count	86	50	136	74	86	160
	D	% of Group	11.0	9.3		11.6	18.1	
		% Total	6.5	3.8	10.3	6.7	7.7	14.4
		Count	211	166	377	115	101	216
	C or CR	% of Group	27.1	30.9		18.0	21.3	
		% Total	16.0	12.6	28.6	10.3	9.1	19.4
		Count	196	151	347	27	25	52
	B	% of Group	25.1	28.1		4.2	5.3	
		% Total	14.9	11.4	26.3	2.4	2.3	4.7
		Count	102	85	187	1	7	8
	A	% of Group	13.1	15.8		.2	1.8	
		% Total	7.7	6.5	14.2	.1	.8	.9

Table 5. Students who successfully completed their course with a grade of “C” or better by SI participant and “passed” or “did not pass” initial test in the course.

Course Completions	Group:		Passed Initial Test (70% or Above)			Did Not Pass Initial Test (Below 70%)		
			Non-SI	SI	N:	Non-SI	SI	N:
	Success	% A, B, C	65.3	74.8	911	22.4	28.1	276
	Non-Success	% D, F, NC	22.4	18.0	272	48.6	44.7	523
	Withdrawals	% W	12.3	7.2	135	29.0	27.2	314
	Total		100	100	1318	100	100	1113

Table 6. Grade Distribution of SI participants with a final grade in the course, grouped by the number of SI sessions attended.

SI Participants							
Grade Distribution by Number of Sessions Attended							
Grades			SI Sessions Attended				Total
			1-2	3-5	6-10	Over 10	
	W or I	Count	84	38	24	22	168
		% of Group	19.9	17.4	14.5	10.7	16.6
	F or NC	Count	76	36	30	31	173
		% of Group	18.0	16.5	18.2	15.0	17.1
	D	Count	57	32	23	24	136
		% of Group	13.4	14.7	13.9	11.7	13.4
	C or CR	Count	112	59	36	60	267
		% of Group	26.5	27.1	21.8	29.1	26.4
	B	Count	70	33	32	41	176
		% of Group	16.5	15.1	19.5	19.9	17.4
	A	Count	24	20	20	28	92
		% of Group	5.7	9.2	12.1	13.6	9.1
	Total	Count	423	218	165	206	1012
		% of Group	100	100	100	100	100

Table 7. SI Students successfully completed their course with a grade of “C” or better by number of SI sessions attended.

Successful Grades by SI Sessions Attended		SI Sessions Attended				Total
		1-2	3-5	6-10	Over 10	
Grades A,B,C	Count A,B,C	206	112	88	129	535
	% Success*	38.5	20.9	16.4	24.1	99.9

* Overall SI success ratio: 52.9%; Overall Non-SI success ratio: 45.9%

CSU Stanislaus - Spring 2004 - Spring 2007
SI Participants (percent of enrolled)

						Total	
		Non-SI		SI			
		Count	% within Academic Term	Count	% within Academic Term	Count	% within Academic Term
Academic Term	04FA	259	81.7%	58	18.3%	317	100.0%
	04SP	199	82.2%	43	17.8%	242	100.0%
	05FA	288	67.4%	139	32.6%	427	100.0%
	05SP	259	62.9%	153	37.1%	412	100.0%
	06FA	198	60.6%	129	39.4%	327	100.0%
	06SP	181	51.7%	169	48.3%	350	100.0%
	07SP	248	45.8%	293	54.2%	541	100.0%
Total		1632	62.4%	984	37.6%	2616	100.0%

CSU Stanislaus Grade Distribution
Spring 2004 - Spring 2007
SI and Non-SI

			Academic Term														Total	
			04SP		04FA		05SP		05FA		06SP		06FA		07SP			
			Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
SI	Grade A		1	8.3%	1	4.8%	5	11.6%	2	6.1%	1	4.3%	4	9.8%	0	.0%	14	7.7%
	B		1	8.3%	2	9.5%	4	9.3%	8	24.2%	8	34.8%	4	9.8%	2	25.0%	29	16.0%
	C		4	33.3%	3	14.3%	15	34.9%	14	42.4%	12	52.2%	14	34.1%	1	12.5%	63	34.8%
	CR		1	8.3%	1	4.8%	3	7.0%	1	3.0%	0	.0%	5	12.2%	0	.0%	11	6.1%
	D		1	8.3%	0	.0%	2	4.7%	4	12.1%	1	4.3%	2	4.9%	0	.0%	10	5.5%
	F		0	.0%	1	4.8%	3	7.0%	4	12.1%	1	4.3%	0	.0%	0	.0%	9	5.0%
	I		0	.0%	0	.0%	0	.0%	0	.0%	0	.0%	1	2.4%	0	.0%	1	.6%
	NC		4	33.3%	12	57.1%	11	25.6%	0	.0%	0	.0%	11	26.8%	5	62.5%	43	23.8%
	W		0	.0%	1	4.8%	0	.0%	0	.0%	0	.0%	0	.0%	0	.0%	1	.6%
Total			12	100.0%	21	100.0%	43	100.0%	33	100.0%	23	100.0%	41	100.0%	8	100.0%	181	100.0%
Non-SI	Grade A		0	.0%	10	15.4%	2	3.0%	2	3.9%	5	11.4%	2	3.6%	4	15.4%	25	7.6%
	B		3	13.0%	18	27.7%	12	18.2%	14	27.5%	7	15.9%	9	16.1%	4	15.4%	67	20.2%
	C		6	26.1%	13	20.0%	18	27.3%	11	21.6%	16	36.4%	13	23.2%	5	19.2%	82	24.8%
	CR		0	.0%	1	1.5%	1	1.5%	0	.0%	4	9.1%	7	12.5%	1	3.8%	14	4.2%
	D		2	8.7%	0	.0%	1	1.5%	6	11.8%	2	4.5%	4	7.1%	3	11.5%	18	5.4%
	F		6	26.1%	3	4.6%	12	18.2%	12	23.5%	4	9.1%	2	3.6%	2	7.7%	41	12.4%
	NC		6	26.1%	20	30.8%	20	30.3%	6	11.8%	5	11.4%	18	32.1%	7	26.9%	82	24.8%
	WU		0	.0%	0	.0%	0	.0%	0	.0%	1	2.3%	1	1.8%	0	.0%	2	.6%
Total			23	100.0%	65	100.0%	66	100.0%	51	100.0%	44	100.0%	56	100.0%	26	100.0%	331	100.0%