
Supplemental Instruction at Gavilan College

Quantitative Outcomes Evaluation

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Overview

At the request of the Equity Committee, the Office of Institutional Research worked with the faculty program coordinator for Gavilan's Supplemental Instruction program to conduct a comprehensive quantitative outcomes analysis to evaluate program effectiveness. After several iterations and feedback from the faculty coordinator, OIR compiled a set of seven analyses. In all seven cases, the available evidence did not support the conclusion that Gavilan's Supplemental Instruction program is having a positive impact on student achievement outcomes.

Basic Design

Gavilan's Supplemental Instruction (SI) program in English is comprised of two overall main components. The first component places an embedded tutor in sections of English courses, and the second attaches the same tutor to the course who then offered additional support outside of class. The embedded tutor attends all class sessions and received basic training on how to be involved both in and outside of class. Instructors also received basic training on how to utilize an SI tutor in their sections.

It is important to note that this design – and thus all analyses in this report – is restricted to the English/ESL departments. While an SI program has existed in the math and sciences, that program is not a part of this analysis. This analysis focused on the SI- and non-SI sections of ENGL 1A, 250, 250P, 260, 260P, 411, 420, 439, 440, ESL 563 and 564 between fall 2012 and fall 2016. The faculty SI program coordinator provided OIR with a list of course reference numbers that identified those sections that had an SI tutor attached in the aforementioned timeframe. OIR was also provided with a list of student ID numbers for those students that utilized the outside of class SI component in fall 2015. Due to record keeping constraints on the part of the program, this was the only term for which OIR was provided data on the outside of class SI component.

After consultation with the faculty program coordinator, a OIR developed a six-pronged evaluation approach. Later, a seventh analysis was added at the request of the faculty program coordinator. The final seven analyses are:

1. Analysis one is comprised a simple comparison of course success rates of all SI and non-SI sections of the above identified courses
2. Analysis two tracks students who were in SI sections and compares their success in later college-level courses to students who had not been in an SI section. This was done to evaluate whether SI had later, indirect benefits for students
3. Analysis three compares the final grades of students in SI sections to the final grades of students in non-SI sections
4. Analysis four compares the success rates of SI and non-SI sections of the same courses taught by the same instructors. This was done in an effort to eliminate instructor bias
5. Analysis five compares the student success rates by course. This was added later at the request of the faculty program coordinator

6. Analysis six is a binary logistic regression model that evaluates the odds of a student passing the course among those who utilized the outside of class SI component in fall 2015 while controlling for many student characteristics and participation in other programs. Note that analysis six is the only analysis that evaluated the outside of class SI component
7. Analysis seven is a binary logistic regression model that evaluates the effect of being in an SI-section on the overall odds of a student passing the course while controlling for many student characteristics and participation in other programs

Findings

The following table represents a summary of the findings from the seven analyses. Complete data tables with detailed findings may be found in Appendix A. The table below is comprised of four columns:

1. Column one references the analysis outlined in the “basic design” section
2. Column two summarizes the finding
3. Column three summarizes the conclusion based upon the finding
4. Column four summarizes the confidence placed in the conclusion based upon the precision of the analysis. In other words, OIR places different levels of confidence in findings based upon the methodology employed. This column represents our professional opinion on the weight the reader should give the finding and conclusion.

#	Finding	Conclusion	Confidence
1	There is no significant difference in course success rates between SI and non-SI sections	SI had no positive impact on achievement outcomes in the identified courses	Moderate
2	There is no significant difference in the later success of students who had taken an SI section as compared to those who had not	SI had no positive impact on achievement outcomes in later transfer-level courses	Moderate
3	There is some evidence to suggest that student final grades are actually higher in non-SI sections as compared to SI sections	SI had no positive impact on achievement outcomes in the identified courses	Moderate

#	Finding	Conclusion	Confidence
4	In a healthy majority of cases, faculty had similar outcomes whether they were teaching in an SI section or a non-SI section of the same course. There were some cases with sufficient numbers of students where faculty saw slight improvements in success and an equal number of cases with the opposite result	SI had no positive impact on achievement outcomes in the identified courses, but there may be evidence that 2 out of the 22 SI instructors were successfully using the SI program in their courses	Low
5	Success rates in SI and non-SI sections varied widely depending on the specific course, but low numbers of both students and different faculty in the different course levels hamper the ability to draw conclusions	SI had no positive impact on achievement outcomes in the identified courses	Very Low
6	Because of small numbers, the margin of error is too large to draw a good conclusion. The estimate is statistically significant, but the margin of error is such that the effect of SI could be considered positive <i>or</i> negative	There is insufficient evidence to conclude that the outside of class SI component had a positive impact on achievement outcomes, but the finding merits further study.	High
7	While a variety of other characteristics of students and programs were associated with changes in the odds of a student passing the identified courses, SI was not one of them. Because this analysis accounts for 20 other factors and given the strength of the statistical findings, OIR considers this analysis by far the most conclusive of the seven.	SI had no positive impact on achievement outcomes in the identified courses	Very High

Limitations

This comprehensive evaluation has a few major limitations.

First, as with any evaluation of educational programming, isolating the effect of one particular program is difficult net of all of the other factors in play. For this reason, even with the relative consistency of the first five analyses, they are not the best way to judge program effectiveness. Research shows that the single biggest variables in predicting student success are a qualified, quality instructor and a student's background. Because the first five analyses are simple comparisons, the results may be unduly influenced by these and other unknown factors.

Analyses six and seven do attempt to control for a variety of other factors, and are thus much better models of the program's effectiveness. However, analysis six is hampered by a

small sample and a single term of data. Because the SI program was only able to provide quality data on student utilization of the outside of class component for fall 2015, the analysis could be confounded by a variety of person-specific or temporally-specific circumstances. Thus, while analysis six is best described as inconclusive, it does provide a useful guidepost for further inquiry. It is for this reason that OIR recommends further study of the outside of class component of SI.

Finally, the analysis is additionally limited by the consideration of a single area of disciplines. In other words, it is only appropriate to conclude that the SI program in English/ESL lacked positive impact on student outcomes, not SI overall. Note, however, that this is also in keeping with the national research that suggests that SI is effective in math/science disciplines but far less so in humanities disciplines.

Conclusions

Taken in total, there is insufficient evidence to conclude that Gavilan's SI program has a positive impact on student achievement outcomes.

Recommendations

OIR recommends additional study of the outside of class component of SI. While the evidence is strong that SI – as currently formulated – is not having a significant positive impact on student achievement outcomes, utilization of the outside of class component is a promising area for further inquiry. If SI program staff are able to furnish OIR with additional sets of student ID numbers, OIR can expand analysis six to include additional student characteristics and terms and rerun the analysis. This may provide higher quality results. The inconclusive finding regarding the effectiveness of the outside of class component of SI leads OIR to believe that this finding should provide a guidepost for discussions about improvements and changes to the SI program.

OIR also recommends following-up with the two faculty out of the twenty-two total faculty who did see positive results while using SI to determine what their best practices may be. This may result in additional ideas for improvements and changes to the SI program.

Appendix A: Complete Analysis Data Tables

Complete tables follow on the next page. Interpreting the results contained in the tables requires that one reads all of the associated notes and interpretation aids contained therein.

Questions about the data tables may be directed to the Office of Institutional Research.

Gavilan College Supplemental Instruction (SI) Evaluation

Course Success Rates of SI/Non-SI Sections, 2012-2016

This sheet shows the overall course success rates for SI and Non-SI Sections

Table 1

Condition	SI	NonSI
Failure	43%	42%
Success	57%	58%

NOTES:

1. The data in this table represents all students enrolled in ENGL 1A, 250, 250P, 260, 260P, 411, 420, 439, 440, ESL 563 and 564 between Fall 2012 and Fall 2016
2. Success is defined as the % of students earning a grade of C or better or P
3. SI indicates the success rates for students in ENGL/ESL sections with embedded Supplemental Instruction
4. Non-SI indicates the success rates for students in the same ENGL/ESL courses but without embedded Supplemental Instruction

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"Institutional Research - Use it for good, never for evil."

This report has seven tables.

- 1 Sheet one shows the overall course success rates for SI and Non-SI Sections
- 2 Sheet two shows the overall success rate of SI and Non-SI students in subsequent college-level courses
- 3 Sheet three shows the overall distribution of student grades for SI and Non-SI Sections
- 4 Sheet four shows the difference in success rates for SI and Non-SI sections taught by the same instructor
- 5 Sheet five shows success rates in SI and non-SI sections by course (OIR does not recommend using this sheet for drawing conclusions)
- 6 Sheet six is a binary logistic regression showing the odds of course success for students receiving extra outside of class SI as compared to those who did not
- 7 Sheet seven is a binary logistic regression showing the odds of course success for students in SI sections versus those who are not

Gavilan College Supplemental Instruction (SI) Evaluation

Success Rates in Later College-Level Courses, 2012-2016

This sheet shows the overall success rate of SI and Non-SI students in subsequent college-level courses

Table 2

Condition	SI	Non SI
Failure	36%	31%
Success	64%	69%

NOTES:

1. Table 2 tracked the students represented by table 1 to measure their success in subsequent college-level courses
2. The data in these tables represents all students enrolled in ENGL 1A, 250, 250P, 260, 260P, 411, 420, 439, 440, ESL 563 and 564 between Fall 2012 and Fall 2016
3. Success is defined as the % of students earning a grade of C or better or P
4. SI indicates the success rates for students in ENGL/ESL sections with embedded Supplemental Instruction
5. Non-SI indicates the success rates for students in the same ENGL/ESL courses but without embedded Supplemental Instruction

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Gavilan College Supplemental Instruction (SI) Evaluation

Grade Distributions of SI/Non-SI Sections, 2012-2016

This sheet shows the overall distribution of student grades for SI and Non-SI Sections

Table 3

Grade	SI	Non-SI
A	7%	12%
A-	5%	6%
B	10%	10%
B-	4%	6%
B+	3%	4%
C	9%	13%
C+	4%	4%
D	5%	7%
F	11%	12%
I	0%	0%
NP	6%	1%
P	15%	3%
W	21%	22%

NOTES:

1. The data in this table represents all students enrolled in ENGL 1A, 250, 250P, 260, 260P, 411, 420, 439, 440, ESL 563 and 564 between Fall 2012 and Fall 2016
2. SI indicates the grades for students in ENGL/ESL sections with embedded Supplemental Instruction
3. Non-SI indicates the grades for students in the same ENGL/ESL courses but without embedded Supplemental Instruction

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Gavilan College Supplemental Instruction (SI) Evaluation Success Rates of SI/Non-SI By Same Instructor, 2012-2016

This sheet shows the difference in success rates for SI and Non-SI sections taught by the same instructor

Table 4

Instructor ID	SI	Non-SI	Difference	SI N	Non-SI N
106	78%	81%	-3%	165	99
113	42%	48%	-6%	83	117
181	26%	55%	-29%	36	223
197	48%	45%	3%	21	26
399	61%	66%	-5%	157	305
454	62%	89%	-27%	29	86
473	68%	62%	6%	115	85
492	50%	51%	-1%	81	129
582	56%	68%	-12%	27	244
647	48%	52%	-4%	300	453
648	27%	43%	-16%	26	315
684	58%	60%	-2%	67	377
764	96%	N/A	N/A	20	-
782	49%	56%	-7%	63	243
792	41%	86%	-45%	27	11
797	65%	N/A	N/A	30	-
834	55%	66%	-11%	227	277
840	43%	46%	-3%	150	257
860	53%	66%	-13%	74	247
865	89%	60%	29%	17	283
897	67%	55%	12%	15	259
945	64%	59%	5%	198	201
Average	57%	58%	-1%	1,928	4,237

NOTES:

1. The data in this table represents all students enrolled in ENGL 1A, 250, 250P, 260, 260P, 411, 420, 439, 440, ESL 563 and 564 between Fall 2012 and Fall 2016
2. A Negative number in the "difference column" indicates that the instructor pass more students in their Non-SI sections of the same course
3. This table presents the course success rates of the same instructors teaching SI and Non-SI sections
4. Each three digit code represents a unique instructor
5. Success is defined as the % of students earning a grade of C or better or P
6. SI indicates the success rates for students in ENGL/ESL sections with embedded Supplemental Instruction
7. Non-SI indicates the success rates for students in the same ENGL/ESL courses but without embedded Supplemental Instruction
8. Ordinarily, success rates would not be reported for any cells with fewer than 100 students. However, given the importance of instructors, an exception was made in this case.

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Gavilan College Supplemental Instruction (SI) Evaluation

Success Rates of SI/Non-SI By Course, 2012-2016

This sheet shows the difference in success rates for SI and Non-SI sections taught by the same instructor

DUE TO INCREASED POTENTIAL BIAS, OIR RECOMMENDS AGAINST USING THIS TABLE FOR DRAWING CONCLUSIONS ABOUT EFFECTIVENESS.

Table 5

Column1	SI	Non SI	SI-Non SI
ENGL1A	60%	54%	6%
ENGL250	52%	54%	-2%
ENGL250P	63%	56%	7%
ENGL260	46%	66%	-20%
ENGL260P	66%	59%	7%
ENGL420	55%	58%	-3%
ENGL440	45%	56%	-11%
ESL563	89%	93%	-4%
ESL564	96%	85%	11%
Overall	57%	58%	-1%

NOTES:

1. The data in this table represents all students enrolled in ENGL 1A, 250, 250P, 260, 260P, 411, 420, 439, 440, ESL 563 and 564 between Fall 2012 and Fall 2016
2. A Negative number in the "difference column" indicates that the instructor pass more students in their Non-SI sections of the same course
3. This table presents the course success rates of SI and Non-SI sections broken down by course
4. The likelihood of error is high in this table due to reduce cell counts. OIR recommends against making a favorable or unfavorable conclusion based upon these data alone.
5. Success is defined as the % of students earning a grade of C or better or P
6. SI indicates the success rates for students in ENGL/ESL sections with embedded Supplemental Instruction
7. Non-SI indicates the success rates for students in the same ENGL/ESL courses but without embedded Supplemental Instruction

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**Gavilan College Outside of Class Extra Supplemental Instruction
Binary Logistic Regression of Student Success, Selected Fall 2015 ENGL/ESL Students
SEE IMPORTANT NOTES BELOW**

This sheet shows a binary logistic regression of the course success rates of students receiving outside of class SI as compared to those who did not

Table 6

Variable	Estimate	Std. Err.	z	p-Value	Significant?	95% CI Lower	95% CI Upper	Interpretation Aid
Supplemental Instruction	0.760	0.349	2.180	0.030	NO	0.076	1.445	There is little evidence to suggest that utilizing the outside of class supplemental instruction component had an impact on the odds of succeeding in a course.
Age 26 - 30	0.122	0.299	0.410	0.683	NO	-0.465	0.709	There is little evidence to suggest that being age 26-30 had an impact on the odds of succeeding in a course.
Age 31 - 40	0.099	0.353	0.280	0.779	NO	-0.592	0.791	There is little evidence to suggest that being age 31-40 had an impact on the odds of succeeding in a course.
Age 41 - 50	0.548	0.421	1.300	0.193	NO	-0.277	1.372	There is little evidence to suggest that being age 41-50 had an impact on the odds of succeeding in a course.
Age 51+	0.908	1.180	0.770	0.442	NO	-1.405	3.221	There is little evidence to suggest that being age 51+ had an impact on the odds of succeeding in a course.
Basic Skills	0.229	0.126	1.820	0.069	NO	-0.018	0.476	There is little evidence to suggest that having a basic skills placement had an impact on the odds of succeeding in a course.
CalWORKS Student	-0.340	0.568	-0.600	0.550	NO	-1.452	0.773	There is little evidence to suggest that being a CalWORKS student had an impact on the odds of succeeding in a course.
Constant	0.017	0.329	0.050	0.958	NO	-0.626	0.661	(Constant)
Course Not Held at Gilroy	0.058	0.137	0.430	0.670	NO	-0.210	0.327	There is little evidence to suggest that campus location had an impact on the odds of succeeding in a course.
AEC Student	0.051	0.242	0.210	0.834	NO	-0.424	0.525	There is little evidence to suggest that being an AEC-registered student had an impact on the odds of succeeding in a course.
EOPS Student	0.346	0.229	1.510	0.131	NO	-0.103	0.795	There is little evidence to suggest that being an EOPS student had an impact on the odds of succeeding in a course.
Foster Youth Student	-0.167	0.315	-0.530	0.595	NO	-0.785	0.450	There is little evidence to suggest that being a foster youth student had an impact on the odds of succeeding in a course.
Kickstart Participant	-0.599	0.230	-2.610	0.009	NO	-1.050	-0.149	There is little evidence to suggest that being a Kickstart participant had an impact on the odds of succeeding in a course.
MESA Student	1.620	0.633	2.560	0.010	YES	0.379	2.860	Holding all other factors constant, being a MESA student results in a 62% increase in the odds of passing the course, give or take about 24%
Puente Student	2.461	1.044	2.360	0.018	YES	0.414	4.508	Holding all other factors constant, being a Puente student results in a 146% increase in the odds of passing the course, give or take about 105%
Student Athlete	-0.169	0.386	-0.440	0.662	NO	-0.925	0.588	There is little evidence to suggest that being a student athlete had an impact on the odds of succeeding in a course.
Student was BOG Eligible	-0.266	0.133	-2.000	0.045	YES	-0.527	-0.005	Holding all other factors constant, being from a low income background results in a 27% decrease in the odds of passing the course, give or take about 26%
Student was Female	0.526	0.125	4.190	0.000	YES	0.280	0.772	Holding all other factors constant, being female results in a 52% increase in the odds of passing the course, give or take about 24%
Student was Non-White	-0.254	0.294	-0.860	0.388	NO	-0.829	0.322	There is little evidence to suggest that being non-white had an impact on the odds of succeeding in a course.
TRiO Student	0.226	0.400	0.560	0.572	NO	-0.558	1.010	There is little evidence to suggest that being a TRiO student had an impact on the odds of succeeding in a course.
Under 21	0.203	0.171	1.190	0.233	NO	-0.131	0.538	There is little evidence to suggest that being under age 21 had an impact on the odds of succeeding in a course.
Veteran Student	0.018	0.482	0.040	0.970	NO	-0.928	0.963	There is little evidence to suggest that being a veteran had an impact on the odds of succeeding in a course.

IMPORTANT NOTES:

N = 1,174

1. The data in this table represents all students enrolled in ENGL 1A, 250, 250P, 260, 260P, 420, 440, and ESL 563 in Fall 2015 Only.
2. In a logistic regression, a "reference category" is omitted from the model in each substantive area to allow for comparison. For example, "White" is excluded from the model, but "Non-White" is included. The appropriate interpretation for the "Non-White" estimate is then: "Holding all other factors constant, Non-White students are 25% less likely to succeed in the identified courses as compared to White students, give or take 57%"
3. Success is defined as the % of students earning a grade of C or better or P
4. In this case, supplemental instruction indicates that the student received additional help from an SI tutor outside of class

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Gavilan College Supplemental Instruction (SI) Evaluation
Binary Logistic Regression of Student Course Success, Selected 2012-2016 ENGL/ESL Sections
SEE IMPORTANT NOTES BELOW

This sheet shows a binary logistic regression of the course success rates of students in SI sections versus those who were in non-SI sections, controlling for various other variables.

Table 7

Variable	Estimate	Std. Err.	z	p-Value	Significant?	95% CI Lower	95% CI Upper	Interpretation Aid
Supplemental Instruction Section	0.887	0.066	-1.620	0.106	NO	0.767	1.026	There is little evidence to suggest that taking a course with supplemental instruction had an impact on the odds of succeeding in a course.
Age Under 21	1.132	0.081	1.740	0.082	NO	0.984	1.303	There is little evidence to suggest that being under age 21 had an impact on the odds of succeeding in a course.
Age 41 - 50	1.281	0.211	1.500	0.134	NO	0.927	1.770	There is little evidence to suggest that being age 41-50 had an impact on the odds of succeeding in a course.
Basic Skills Student Placement	0.968	0.056	-0.560	0.576	NO	0.865	1.084	There is little evidence to suggest that having a basic skills placement had an impact on the odds of succeeding in a course.
Section not at Gilroy	0.954	0.055	-0.830	0.408	NO	0.852	1.067	There is little evidence to suggest that campus location had an impact on the odds of succeeding in a course.
EOPS Student	1.132	0.112	1.260	0.207	NO	0.933	1.374	There is little evidence to suggest that being an EOPS student had an impact on the odds of succeeding in a course.
AEC Student	0.843	0.093	-1.550	0.122	NO	0.679	1.047	There is little evidence to suggest that being an AEC-registered student had an impact on the odds of succeeding in a course.
Veteran Student	1.229	0.246	1.030	0.303	NO	0.830	1.818	There is little evidence to suggest that being a veteran had an impact on the odds of succeeding in a course.
Athlete Student	0.792	0.165	-1.120	0.263	NO	0.526	1.192	There is little evidence to suggest that being a student athlete had an impact on the odds of succeeding in a course.
Female Student	1.455	0.079	6.930	0.000	YES	1.309	1.618	Holding all other factors constant, being female results in a 45% increase in the odds of passing the course, give or take about 15%
Non-White Student	0.780	0.072	-2.690	0.007	YES	0.650	0.935	Holding all other factors constant, being non-white results in a 22% decrease in the odds of passing the course, give or take about 13%
Age 26 - 30	1.405	0.174	2.750	0.006	YES	1.103	1.791	Holding all other factors constant, being age 26-30 results in a 40% increase in the odds of passing the course, give or take about 30%
Age 31 - 40	1.538	0.200	3.310	0.001	YES	1.192	1.983	Holding all other factors constant, being age 31-40 results in a 53% increase in the odds of passing the course, give or take about 34%
Age Over 51	2.150	0.648	2.540	0.011	YES	1.192	3.881	Holding all other factors constant, being over age 51 results in a 115% increase in the odds of passing the course, give or take about 96%
BOG Student	0.833	0.048	-3.200	0.001	YES	0.744	0.931	Holding all other factors constant, being from a low income background results in a 27% decrease in the odds of passing the course, give or take about 26%
MESA Student	3.157	0.893	4.070	0.000	YES	1.814	5.494	Holding all other factors constant, being a MESA student results in a 62% increase in the odds of passing the course, give or take about 24%
TRiO Student	1.873	0.374	3.140	0.002	YES	1.266	2.771	Holding all other factors constant, being a TRiO student results in a 87% increase in the odds of passing the course, give or take about 61%
Puente Student	7.760	2.615	6.080	0.000	YES	4.009	15.022	Holding all other factors constant, being a Puente student results in a 670% increase in the odds of passing the course, give or take about 300%
Foster Youth Student	0.659	0.097	-2.820	0.005	YES	0.494	0.880	Holding all other factors constant, being a Foster Youth results in a 35% decrease in the odds of passing the course, give or take about 16%
Kickstart Student	0.686	0.083	-3.130	0.002	YES	0.541	0.869	Holding all other factors constant, being a Kickstart student results in a 31% decrease in the odds of passing the course, give or take about 15%
Constant	1.405	0.157	3.040	0.002	YES	1.128	1.749	(CONSTANT)

IMPORTANT NOTES:

N = 6,150

1. The data in this table represents all students enrolled in ENGL 1A, 250, 250P, 260, 260P, 420, 440, and ESL 563 in Fall 2015 Only.
2. In a logistic regression, a "reference category" is omitted from the model in each substantive area to allow for comparison. For example, "White" is excluded from the model, but "Non-White" is included. The appropriate interpretation for the "Non-White" estimate is then: "Holding all other factors constant, Non-White students are 25% less likely to succeed in the identified courses as compared to White students, give or take 57%"
3. Success is defined as the % of students earning a grade of C or better or P
4. In this case, supplemental instruction indicates that the student received additional help from an SI tutor outside of class

Data retrieved on 2017.04.04 at 0945 hours from GIDS tables SECTION, LOCATIONS, DEPARTMENTS, ACCTMETHODS, CLS_GRADES, BAS_DEMOGRAPHICS, SECTADDN, SCHDTYPES and PEOPLE via Hyperion.

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This report has seven tables.

- 1 Sheet one shows the overall course success rates for SI and Non-SI Sections
- 2 Sheet two shows the overall success rate of SI and Non-SI students in subsequent college-level courses
- 3 Sheet three shows the overall distribution of student grades for SI and Non-SI Sections
- 4 Sheet four shows the difference in success rates for SI and Non-SI sections taught by the same instructor
- 5 Sheet five shows success rates in SI and non-SI sections by course (OIR does not recommend using this sheet for drawing conclusions)
- 6 Sheet six is a binary logistic regression showing the odds of course success for students receiving extra outside of class SI as compared to those who did not
- 7 Sheet seven is a binary logistic regression showing the odds of course success for students in SI sections versus those who are not