Learning Support Services

2014 – 2015 Analysis of Program Utilization

Emphasis on Student Participation by Academic Divisions and Departments

The purpose of this report is to offer the UCSC community an overview of the student utilization and cost of the academic support programs provided by Learning Support Services during the 2014-2015 academic year with a focus on Learning Support Services student utilization and cost within academic divisions and academic departments. The two major programs that Learning Support Services offers are Modified Supplemental Instruction, small, weekly interactive learning sessions (10 to 12 students) led by an undergraduate student who has previously taken the class and done well, and small group tutoring wherein a student who has previously taken the course and done well meets each week with groups of students not to exceed four members and engages the students in interactive learning activities to develop their understanding of the course material. One-to-one writing tutoring on a drop-in or weekly appointment basis is also available to all students for any course (with the Writing Program mandated exception of College Core courses, and Writing 20, 21, 22, and 23). Drop-in Math tutoring for math courses up through Math 23 is also offered.

This analytic discussion will begin with an overview of UCSC student utilization of Learning Support Services programs during the 2014-15 academic year focused on the number of program participants, some characteristics of the students using the services, and the cost of the services. The report will then present a similar analysis of both student program utilization and program costs for each of the five academic divisions and for academic departments within each division where data indicates that students used programs offered by Learning Support Services.

General Overview of Learning Support Services Student Utilization and Overall Expenditures During the 2014-2015 Academic Year.

During the 2014-15 academic year Learning Support Services served 5,745 students, approximately 35% of the undergraduate student population. The total number of tutoring/Modified Supplemental Instruction (MSI) contact hours during the academic year was 72,723 resulting in an average of 13 contact hours per student participant. The total cost of the salaries paid to the 268 student MSI Learning Assistants and tutors was $439,156.

Overview of Learning Support Services Programs, Academic Year 2014-2015

Table 1 presents a program-by-program description of student utilization and cost of academic support services for each of the programs offered by Learning Support Services. A few of these programs are partnerships with other units and academic divisions and departments. The program labeled STARS/WRITE tutoring is a writing mentorship program co-sponsored by Services to Transfer and Reentry Students, STARS, and Learning Support Services and funded by LSS. Spanish for Heritage Speakers is a partnership between the Spanish Department and LSS and is co-funded by the Humanities Division and LSS. All other programs are created through partnerships between LSS, academic departments and individual faculty members and funded by LSS. In Table 1 the total number of students is an unduplicated count where each student who used the program during the academic year is counted once. LSS is defining a service delivery as a student's quarterly commitment to attend sessions with-in a designated program. For example, if a student attends MSI for Chem 1A and Math 3, that student is counted as having two service deliveries.

Table 1 Learning Support Services Overall Utilization Academic Year 2014-2015

Program	Total Number of Students	Service Deliveries	Contact Hours	Average amount of Contact Hours Students Received*	Total Cost of Student Salaries
Total LSS	5,745	12,286	72,723	13	$ 439,155.50
MSI	4,498	8,167	55,684	12	$ 228,330.27
Small Group Tutoring	1,947	2,607	11985	6	$ 162,287.99
Weekly Writing Tutoring	160	192	752	5	$ 17,590.66
Drop-in Writing	219	465	248	1	$ 9,713.76
Drop-in Math	166	421	163.	1	$ 3,451.50
STARS/WRIT	16	93	97	6	$ 10,163.24
SPHS	142	265	1,324	9	$ 10,163.24
Mentoring	14	20	319	23	$ 5,458.68

*hours have been rounded to the nearest whole hour.

As the two largest programs that LSS offers are Modified Supplemental Instruction and Small Group Tutoring, we will present a more detailed discussion of each program before moving forward into a discussion of the LSS program utilization data for each academic division and individual academic departments within each division.

Modified Supplemental Instruction(MSI)

Learning Support Services consults with academic departments and refers to student course-specific academic performance data to select courses in which students seem likely to benefit from the opportunity to choose to attend a Modified Supplemental Instruction session each week throughout the quarter. These courses tend to be large lecture courses that are gateway courses for entry into academic majors and which are generally taken by first and second year UCSC students. During the 2014-15 academic year, LSS supported 140 classes with MSI, 44 in fall, 50 in winter, and 46 in

spring quarters and 4,498 students used MSI at least once, 78% of the total number of students who used LSS during the academic year. Student utilization was highest for frosh, 37%, with sophomores accounting for 25%of the MSI use. This is not surprising as the majority of the MSI supported classes are large, lower division, classes necessary for major declaration. Table 3 offers a more in-depth overview of the various MSI and tutoring programs.

Table 3 Percentage of Student Academic Level by LSS Program

Program	Total Number of Stu	Freshman	Sophomore	Junior	Senior
Total LSS	5745	34%	24%	24%	16%
MSI	4498	37%	25%	23%	13%
Small Group Tutoring	1947	27%	23%	25%	23%
Weekly Writing Tutoring	160	58%	25%	8%	7%
Drop-in Math	166	59%	29%	7%	2%
Drop-in Writing	219	39%	15%	22%	22%
STARS/WRIT	16	0%	0%	63%	38%
SPHS	142	31%	36%	23%	10%
Mentoring	14	29%	57%	7%	0%

One of our main goals guiding the design and implementation of MSI sessions is to increase educational equity at UCSC by engaging students who may have attended low performing k-12 schools in low-income communities to benefit from peer-guided learning so as to be more competitive in classes wherein many of the students have attended very prestigious and high performing high schools. At UCSC the majority of these students are identified as EOP students. Therefore, we are using the EOP Marker to report this data in this report. During the 2014-15 academic year, 2,737 EOP students attended MSI sessions, 46% of the total MSI attendees and 41% of the EOP students enrolled at UCSC last year. Table 4 presents a more detailed analysis of EOP LSS utilization. One interesting trend is that EOP students seem to be using MSI more frequently than non-EOP students as their percentage of contact hours is higher.

Table 4 EOP Student Utilization of Learning Support Services Programs and Services

Programs	Number of Total Students	Number of EOP Students	EOP %	Total Contact Hours	EOP Contact Hours	% EOP Contact Hours
Total LSS	5,745	2737	48%	72721	37495.75	52%
MSI	4498	2076	46%	55684	27429	49%
Small Group Tutoring	1947	1040	53%	11986	7802.5	65%
Weekly Writing Tutoring	160	101	63%	752	522	69%
Drop-in Math	166	77	46%	163.	94.25	58%
Drop-in Writing	219	140	64%	249	168.75	68%
STARS/WRIT	16	7	44%	97	21.5	22%
SPHS	142	124	87%	1324	1153	87%
Mentoring	14	13	93%	319	304.75	96%

It is the hope of Learning Support Services that participating in the MSI program improves EOP student's access to academic success.

Small Group Tutoring Program

The majority of the tutoring offered by Learning Support Services is small group tutoring where groups do not usually exceed four students. Due to our serious budgetary shortfall during the 2014-15 academic year, some tutoring groups did become as large as six students. The educationally appropriate best practices of Learning Support Services were compromised by our financial difficulties and our attempt to offer academic support to fulfill students' requests.

During the 2014-15 academic year, 1,947 students participated in the small group tutoring program. 1,040, 53% were EOP students. This tutoring resulted in a total of 11,986 tutor/student contact hours. EOP students received 65%, 7,803 contact hours. Although a slightly higher percentage of frosh, 27%, used small group tutoring, the utilization is fairly close for all four student academic levels: sophomores, 23%, juniors, 25%, and seniors 23%.

Learning Support Services attempts to find a tutor for any class for which we have a student request for tutoring. During the 2014-15 academic year we, therefore, hired, trained, and evaluated tutors for 285 classes throughout the university curriculum. (Classes are counted each quarter that they are supported.) Additionally, we restored our tutoring assistance for MSI supported classes, a program that was discontinued for two quarters due to LSS budget shortfalls during the 2013-14 academic year. Students seeking tutoring for MSI supported classes are also required to attend an MSI session each week.

Table 5 presents an overview of students' utilization of Modified Supplemental Instruction and Tutoring by Academic Division. Many of the utilization patterns illustrated in Table 5 will not be surprising. Students enrolled in courses within divisions offering the most popular majors at UCSC experienced more tutoring and Modified Supplemental Instruction utilization.

Table 5 Totals by Academic Disciplines (Does not include Drop-in services)

Discipline	Service Deliveries	Total Class Enrollment of Classes Supported	Percent of Utilization	Total Contact Hours	Total Cost of Student Salaries
Arts	68	2,096	3%	323	$3,873.52
Engineering	1,929	13,446	14%	10,642	$57,622.67
Humanities	951	8,418	11%	4,855	$48,966.68
Physical and Biological Sciences	6,197	36,581	17%	43,452	$188,731.69
Social Sciences	2,206	16,560	13%	12,507	$73,757.01

As is obvious, the Arts division relies least on the style of academic support that LSS offers through the Modified Supplemental Instruction program, MSI, probably due to the performance emphasis of many of its courses. Not only did LSS support few courses in the Arts Division, only a total of 3% of the students in these classes used the available tutoring and/or MSI options. The Humanities Division also accounted for a small number of student MSI and/or LSS tutoring contact hours with a total of 4,855. Only 10%of the students enrolled in courses supported by MSI and/or tutoring chose to attend sessions. As many of the courses in the Humanities Division rely on such skills as language learning, critical and analytic thinking, and excellent paper writing skills, it is likely that students might benefit from more group tutorial/interactive learning experiences.

In the Engineering Division 64 courses were supported with MSI and/or LSS tutoring and 14% of the students enrolled in these courses chose to utilize MSI and/or LSS tutoring. The combined number of student contact hours among MSI and LSS tutoring sessions was 10,642.

The Division that used the next largest number of Learning Support Services MSI and/or tutoring hours was the Social Science Division. Thirteen per cent of the students attending LSS supported classes used the MSI and/or tutoring services, 1% fewer students than used MSI and/or tutoring in the School of Engineering. However, the student MSI users in the Social Science Division, on average, seemed to have utilized more MSI and/or tutoring contact hours than the students in the School of Engineering. The total enrollment in the LSS supported classes in the Social Science Division was larger, 16,560. This resulted in 12,507 contact hours, more than the student utilization in the School of Engineering.

The UCSC Division where MSI and tutoring are most frequently used is the Division of Physical and Biological Sciences. Seventeen per cent of the students enrolled in classes that LSS supported with MSI and/or tutoring made use of these services resulting in a total of 43,452 contact hours.

Overall, Learning Support Services is providing academic support for students in all of the academic divisions with the majority of utilization being in the divisions with large, required, lower-division courses that are gateway courses for popular majors at UCSC. Therefore, the Division with the largest number of student/tutor/MSI contact hours was the

Physical and Biological Sciences Division followed by the Social Sciences Division and in third-place, the School of Engineering.

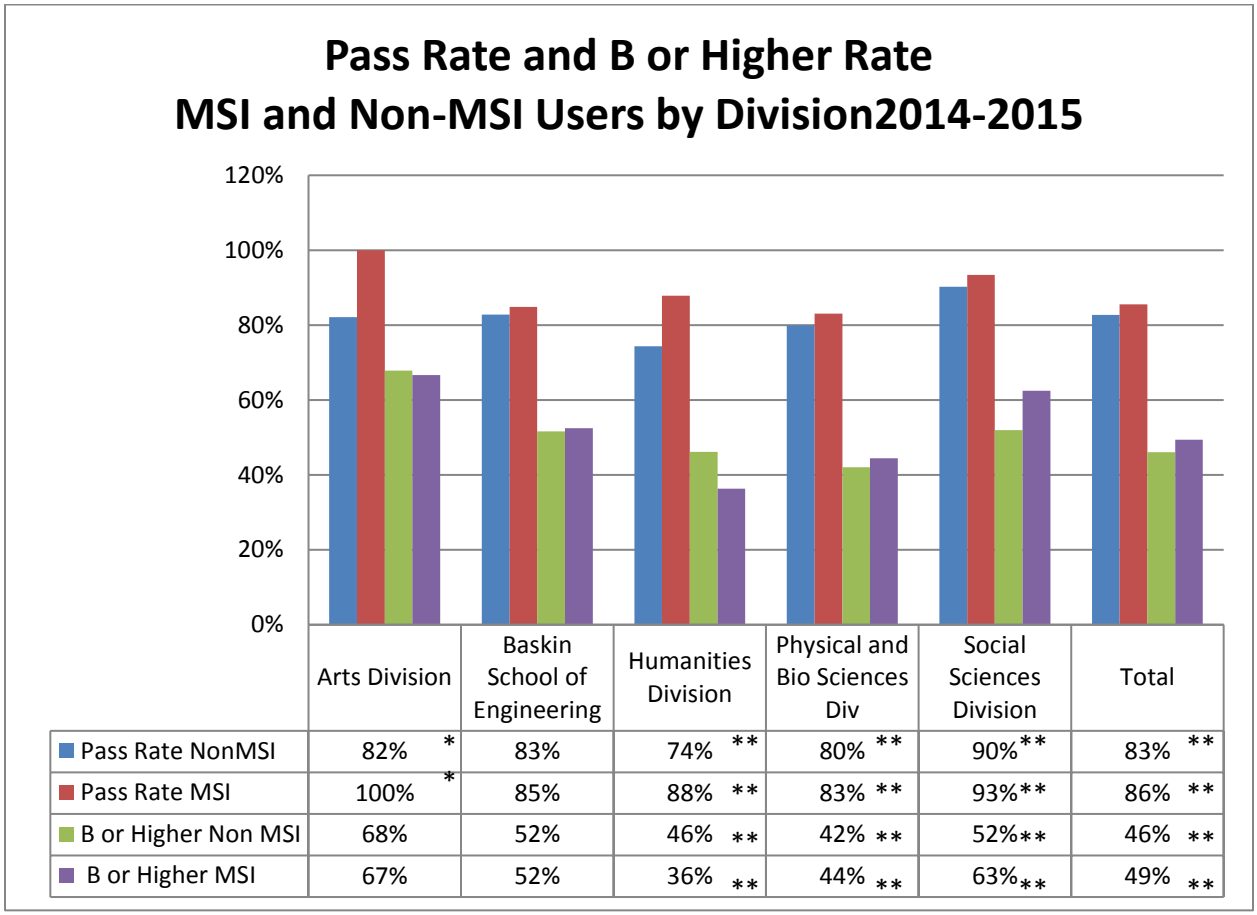
Data explicating the course by course utilization of MSI and tutoring found in Appendix 1 at the end of the report illustrates LSS student utilization within academic departments and particular gateway courses, highlighting the popularity of these programs among UCSC Students. Based on data previously presented in this report, one can infer much of this program utilization is by EOP students. This adds further evidence to the important role that tutoring and MSI can play for first and second year UCSC students, particularly those from low-performing k-12 schools.

The next section of this report considers possible relationships between student's participation in MSI and their course performance. The purpose of this analysis is to discern what effect MSI may be having on student's academic achievement.

MSI Effectiveness.

Chart 1 compares Pass Rates and B or Higher Rates by division for MSI users and non-users. In each division, MSI users compared to non-users had higher Pass Rates with the overall difference being 3%, 86 % for MSI users versus 83% for non-MSI users. All differences in divisional Pass Rates for MSI attendees were statistically significant except in the School of Engineering. An analysis of course grade data illustrates varied student achievement patterns across the divisions. Specifically, there is more variation in the B or Higher Rates. The B or Higher Rate was greater, as well as being statistically significant for MSI users, in both Physical and Biological Sciences (PBSci) and Social Sciences (Soc Sci), the two divisions that attract the most student MSI utilization

Chart 1

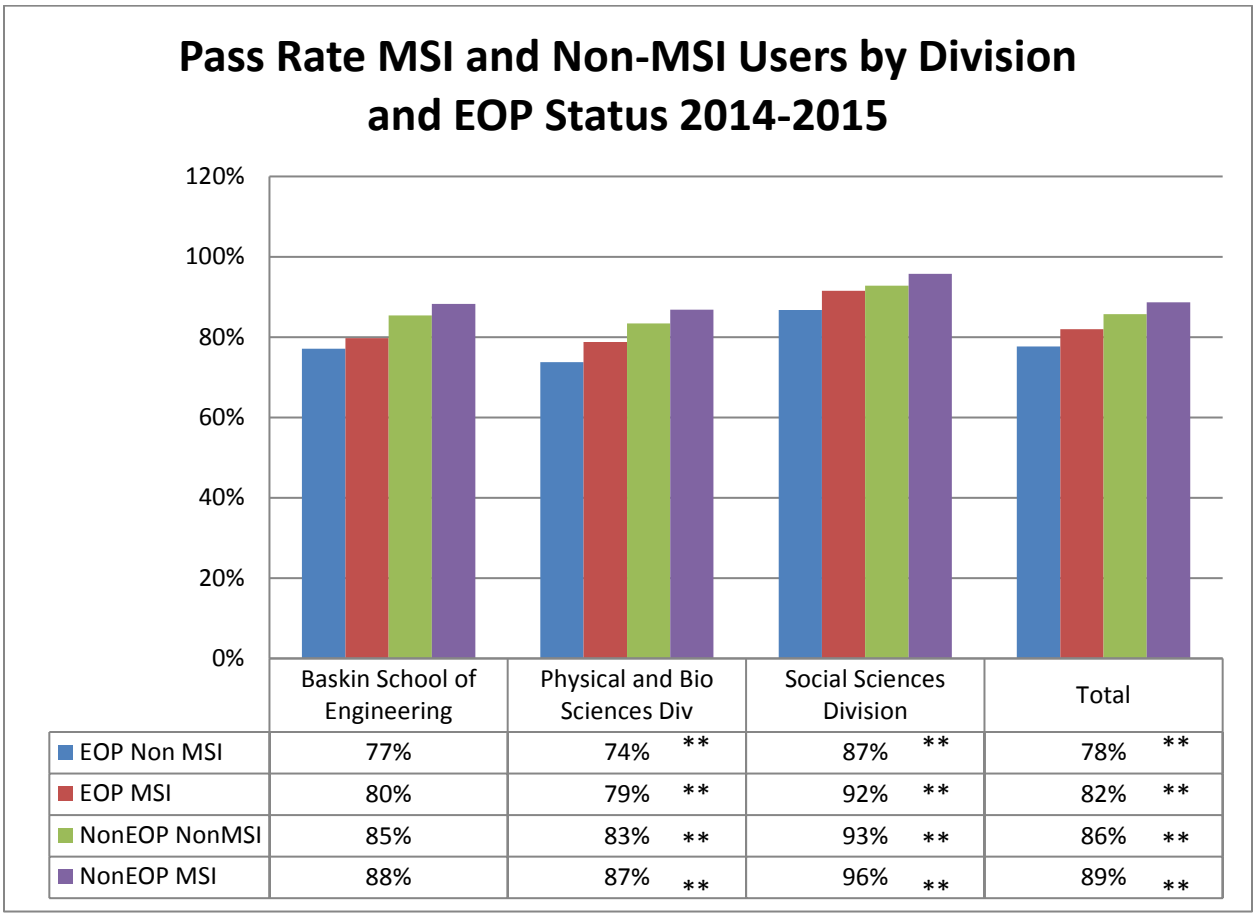


	Arts Division	Baskin School of Engineering	Humanities Division	Physical and Bio Sciences Div	Social Sciences Division	Total
Pass Rate NonMSI	82% *	83%	74% **	80% **	90%**	83% **
Pass Rate MSI	100% *	85%	88% **	83% **	93%**	86% **
B or Higher Non MSI	68%	52%	46% **	42% **	52%**	46% **
B or Higher MSI	67%	52%	36% **	44% **	63%**	49% **

T-Tests were run to test for significance for the Pass Rates of MSI users versus non users and the B or Higher rates of MSI users versus non users, * p<0.5 , **p<.001

Chart 2 compares the Pass Rate for EOP student MSI users and non-users. The Arts and Humanities Divisions are not reported on this chart as MSI supported very few courses in those divisions. Again, all MSI users in the PBSci and Soc Sci Divisions had higher course Pass Rates which were statistically significant. Interestingly, the EOP MSI-users had an overall Pass Rate of 82% versus the EOP non-MSI users who had a 78% Pass Rate. However, both of the MSI user and non-user groups of EOP students passed at lower rates than the non-EOP students. Non-EOP students who used MSI passed at an 89% rate and non-EOP non-MSI users passed at an 86% rate. It appears that attending MSI increases the course pass rate for both EOP and non-EOP students but that EOP students continue to be academically disadvantaged.

Chart 2

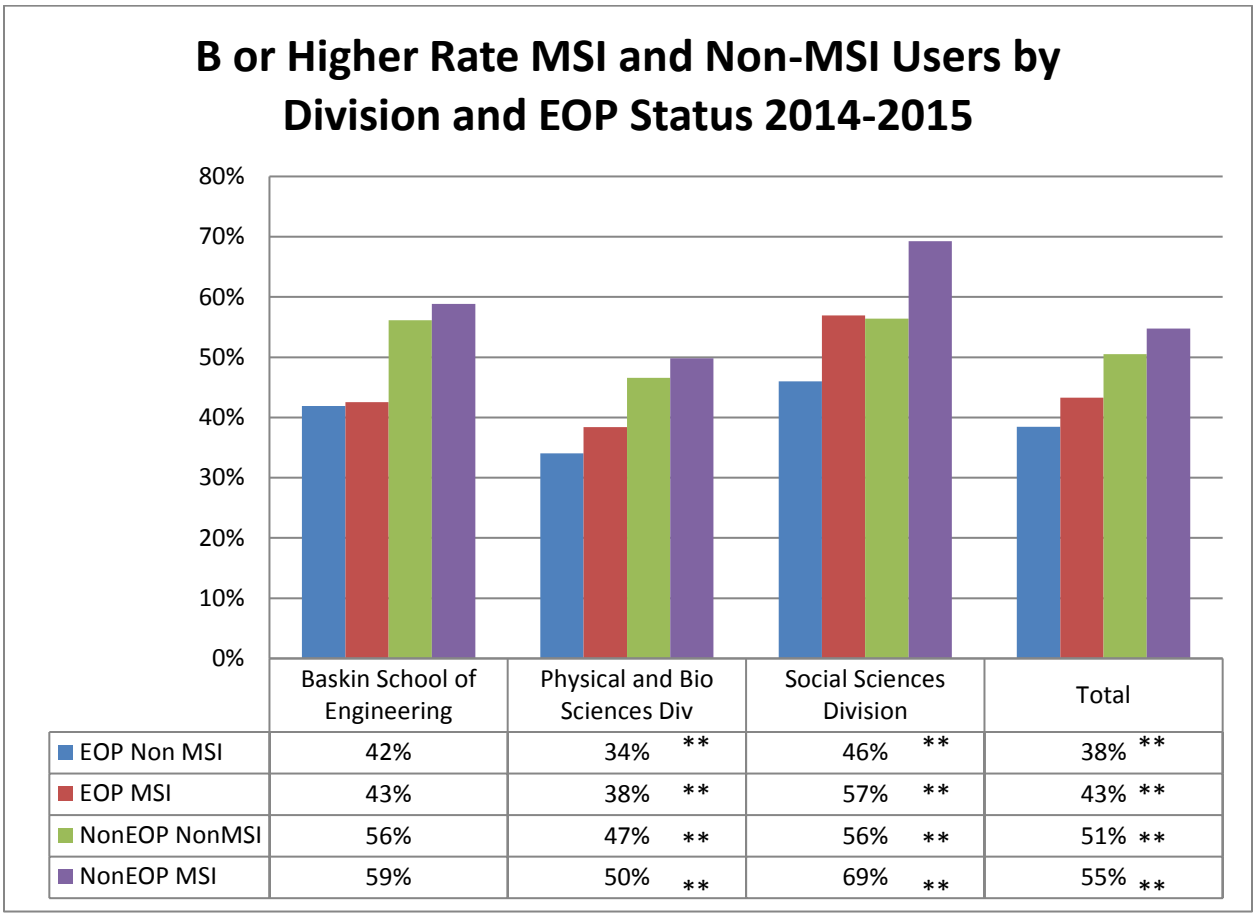


	Baskin School of Engineering	Physical and Bio Sciences Div	Social Sciences Division	Total
EOP Non MSI	77%	74% **	87% **	78% **
EOP MSI	80%	79% **	92% **	82% **
NonEOP NonMSI	85%	83% **	93% **	86% **
NonEOP MSI	88%	87% **	96% **	89% **

T-Tests were run to test for significance for EOP MSI users versus non users and for non-EOP user versus non users, testing done with-in the EOP non-EOP demographic **p<.001

Chart 3 compares the B or Higher Rate for MSI users and non-users categorized by student's EOP status. Similar patterns to the Pass Rate differences described in Chart 2 are seen, however, the educational equity issues are even more pronounced as even with MSI utilization EOP students had a 43% B or Higher Rate versus non-EOP MSI users who had a 55% B or Higher Rate, a 12% difference. Although MSI attendance increases an EOP student's likelihood of achieving a higher degree of course specific academic success than an EOP student who does not attend MSI for the course, neither EOP student achieves equal course grades to their non-EOP peers making similar MSI attendance choices. Additionally, non-EOP students are likely to earn a higher course grade than the EOP students who attend MSI.

Chart 3



	Baskin School of Engineering	Physical and Bio Sciences Div	Social Sciences Division	Total
EOP Non MSI	42%	34% **	46% **	38% **
EOP MSI	43%	38% **	57% **	43% **
NonEOP NonMSI	56%	47% **	56% **	51% **
NonEOP MSI	59%	50% **	69% **	55% **

T-Tests were run to test for significance for EOP MSI users versus non users and for non-EOP user versus non users, testing done with-in the EOP non-EOP demographic **p<.001

Appendix 2 presents the Pass Rates by division, department, and class for MSI users and non-users and by EOP status. The courses are reported for the year. Some courses were only offered once in the year while others, such as Precalculus, Math 3, were offered 5 times, multiple sessions some quarters and every quarter (fall, winter, and spring). The data reported combines all courses that were offered and supported by MSI during 2014-2015. The highlights reported below are organized by division on the overall Pass Rates for MSI users versus non-users, however the EOP and non-EOP performance is not always the same both in terms of users having higher or lower Pass Rates and which departments and courses tested for significance.

Appendix 3 is similar to Appendix 2 but includes more varied results regarding students' B or Higher Rates. For most divisions, the Pass Rate data has more statistical significance in various departments and for specific courses thus, the B or Higher Rates are not mentioned in the Divisional highlights. There is an exception in the Social Sciences Division therefore that division will be analyzed for B or Higher Rate highlights.

Arts Division

The only courses supported with MSI in the Arts Division are those in the Music 30 series. MSI for the Music 30 course focuses on ear training. As can be seen in the appendices, MSI attendance in none of the individual classes tested to be statistically significant when students who attended MSI were compared with students who did not attend, but the combined class total Pass Rate of MSI users (100%) versus non-users (82%) was statistically significant.

School of Engineering

Although as a division and by department, the student Pass Rate differences were not statistically significant, of the 12 courses supported throughout the year three, AMS 11A, AMS 11B, and CMPS 101, did have statistically higher Pass Rates for MSI users than non-MSI users.

Humanities Division

The only course supported by MSI in Humanities is, Introduction to Logic, Philosophy 9, thus all data previously reported for the division strictly related to this course.

Physical and Biological Sciences Division

Of the eight Departments supported by MSI, the Pass Rates were higher for MSI users for all departments except Physics and statistically significant in five Departments. Three of the departments that tested positively for statistical significance had a 10% higher Pass Rate for MSI users. These Departments included Earth and Planetary Sciences, Ecology & Evolutionary Biology, and Microbiology & Env Toxicology. In the Department of Mol/Cell/Developmental Biology, three classes of the six classes supported by MSI had statistically significant higher Pass Rates for MSI users versus non-MSI users. These classes were BIOL 20A: 8% higher, BIOL 100: 7% higher and BIOL 105: 5% higher. It seems that MSI had the least success in Mathematics and Physics where many of the courses had higher Pass Rates for MSI users but only MATH 2 and Physics 5C were statistically significant.

Social Science Division

In the Social Science division when looking at Pass Rates, MSI was most successful in Economics where the MSI Pass Rate was 4% higher and three of the five classes supported with MSI had a statistically significant higher Pass Rate for MSI users. This group of classes included ECON 2 where the Pass Rate was 10% higher for MSI users. MSI was very successful in Sociology where the overall difference in Pass Rate for users and non-users was 4%, 97% versus 93% and there was an 11% difference in Pass Rates for MSI users 97% and non-MSI users 86% in SOCY 15. In Psychology, although the Pass Rate was higher in 5 of the 6 courses supported by MSI it was only statistically significant in PSYC 2 where the difference was 5%, 98 % for users versus 93% for non-users. In the departments of Environmental Studies and Latin American and Latino Studies the Pass Rates over all were higher for MSI users than non-MSI users but they were not statistically significant nor were any of the differences in course performance between MSI users and non-users statistically significant in individual courses in those departments.

It is interesting to note that all 5 departments supported with MSI had higher B or Higher Rates for MSI users versus non-MSI users. The overall difference in B or Higher Rates for MSI and non-MSI users by each department is Economics: 9% higher, Environmental Studies and Latin American and Latino Studies: 15% higher, Psychology: 7% higher and Sociology 10% higher. Many of the courses supported in Economics, Psychology, and Sociology are those that are

included in the qualification for the major. Those majors have GPA requirements that are often around the B average thus, MSI may be quite helpful for students trying to qualify for the majors.

In conclusion, students who make a commitment to attend Modified Supplemental Instruction sessions are likely to earn higher course grades than similar students who do not choose to participate in the MSI program offered by Learning Support Services. Unfortunately, however, attending MSI does not seem to equalize the academic success differences continually evident between students who come to UCSC having more comfortable economic circumstances and having attended more academically effective high schools. Students who are designated as eligible for the Educational Opportunity Program, EOP who attend MSI do not tend to match the academic achievement of their more privileged peers. As data throughout this report clearly indicates, both non-EOP and EOP students who attend MSI sessions perform better academically than do their non-EOP and EOP peers who do not attend MSI, but the EOP students do not achieve equal academic success to their non-EOP peers.

As the tutoring programs available through LSS serve fewer students than the MSI program, and as fewer students in classes use tutoring, LSS cannot effectively make comparisons among these students. Yet, it is likely that the same difficulties regarding the continual influence of unequal educational opportunities among EOP and non-EOP students exist.

Learning Support Services is hopeful that this report will encourage academic divisions and departments to continue to work in partnership with us to increase the variety, scope, and effectiveness of academic support programs available to UCSC students. Additionally, it is our mission to engage in a campus effort to increase educational equity at UCSC by reshaping the within and beyond classroom educational strategies and opportunities available to students from under-resourced k-12 schools so as to equalize their likelihood of demonstrating academic excellence.

As an important next step in our endeavor to improve our academic support programs for students, Learning Support Services seeks to improve our partnerships with academic departments at UCSC. Together we will analyze the academic course expectations, the apparent academic strengths of successful students, and the most effective academic support options that we can provide for less-prepared students within classrooms and through supplemental instruction, tutoring, peer study groups, etc. Working with faculty and advisers, students' instructional needs will be assessed, appropriate learning strategies will be introduced in interactive learning sessions led by successful students, and course performance data will be continually collected and analyzed. It is only with closer ties to academic departments that Learning Support Services can best participate in the facilitation of truly discipline and course specific academic support options for students.

Therefore, the goal of this report is to increase communication and promote closer coordination between academic Departments and Divisions and Learning Support Services.

Note: The Appendixes have been deleted from this report.