

ANALYSIS OF THE EFFECTIVNESS OF TUTORIAL SERVICES PROVIDED BY THE ACADEMIC RESOURCE CENTER

Los Angeles Valley College

Executive Summary

The analysis attempts to examine whether the different tutorial programs provided by the Academic Resource Center contributed to improve students' success, retention, and persistence, or not. Records of students who get tutorial services in Spring, Summer, and Fall semesters of 2015 were pulled from the Tutor-Track and SIS-DEC databases. Students who attended the same courses in the same semesters but did not receive tutorial services were identified as Comparison Group for the analysis. The number of hours tutored, and previous GPA were used as independent variables to measure variations in success, retention, and persistence between the "Tutored Group" and the "Comparison Group". The following are the main conclusions of the analysis:

- Students who are tutored have a higher success rate compared to those not-tutored. On the average, a 10% gap observed between students who get tutored and those who did not (Max, 16%, Writing Center; Min, 9%, Math LAB).
- There is a positive correlation between students' success rate and the number of hours students get tutored ($Y=0.0216x+0.6614$; $r^2 = 0.6289$). However, the effect of tutorial hours on success rate levels or decline after passing the 20 hours limit.
- Tutored students had higher retention rates than not-tutored students (Average difference 6%; Max 12%, STEP; Min 6%, Biology, Math Lab.)
- Tutored students have a higher persistence rate than not-tutored students (exceptions: Spring Group Math-LAB students and Fall Group Biology students.)
- Students with relatively higher GPA are disproportionately attending the tutorial programs being provided by the Academic Resources Center.
- Tutored students with lower GPA gain more in terms success rate than students with higher GPA.
- Service Satisfaction: 97% of the students indicated that they were "Satisfied" or "Very Satisfied" with the services provided in the tutorial centers.
- Learning Outcome:
 - a. Over all, tutored students in Fall 2015 got pass grades in 71% of the courses they get tutored (Writing center 83%, General Tutoring 76%, and Math LAB 56%). This is relatively higher success rate compared to LAVC average for the semester, 66%.
 - b. From 196 students who get tutored in Fall 2015 and returned the survey, 143 (73%) indicated that they have learned at least one strategy from the tutoring they attended. 64 of the 196 students (33%) indicated that they have implemented the strategy they learned in their own learning

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Introduction

The Academic Resource Center of the Los Angeles Valley College provide tutorial services to help students achieve their educational goals through “individualized, collaborative, and self-paced” tutorial programs.¹ Math Lab, Writing Center, General Tutoring, Biology Tutoring, and STEP Tutoring are the main tutorial services being provided to students at the Center. How effective is the Academic Resource Center in providing the services? Did the services provided contributed to students’ success? The main objective of this analysis is therefore to measure the effectiveness of the tutorial programs in improving students’ success. The specific objectives are to know whether (1) students who participated in STEP, Math Lab, Writing Center, Biology, and General Tutoring in Spring and Fall 2015 semesters achieved higher success, retention, and persistence rates than those who did not? (2) students were satisfied with the services provided by STEP, Math Lab, Writing Center, and General Tutoring centers in Fall 2015? (3) students who used the Math Lab, Writing Center, and General Tutoring services in Fall 2015 achieved the following learning outcomes as stipulated in the SLO: (a) Students who received tutoring services will pass the course for which they were tutored. (b) Students tutored will be able to explain one strategy learned from their tutoring session and how they implemented it in their own learning

Methodology

The analysis is made based on data collected from Tutor Track, SIS-DEC, and surveys. Students visit records were downloaded from Tutor Track for all the tutorial services provided in Spring, Summer, and Fall 2015 Semesters. Graded enrollment data of students were pulled from DEC for the corresponding semesters. GPA of students before and after starting the tutorial programs were calculated based on graded enrollment data. Hours tutored and GPA were grouped and recoded for convenience to make the analysis. Students’ Tutor-Track data and SIS-DEC data were linked using Student ID as primary key and other secondary keys as deemed necessary. In matching Tutor-Track data with SIS-DEC data, students’ visit without matching section number or course identifier are excluded from the analysis². Students who took the same type of course in the same semester but not-tutored are selected as comparison

¹ <http://www.lavc.edu/writingcenter>

² Some students do not record for which course /section they are being tutored. Some others simply use the previous semester section and course identifiers for the semester they are being tutored, making it difficult to match the hours tutored with the courses they get tutored.

groups in the analysis. Success³, Retention⁴, and Persistence⁵ rates are calculated for those tutored and not-tutored groups for each of the tutorial centers, and combined. Chi-Square test is used to measure significance level in success, retention, and persistence rate differences between the tutored and not tutored groups. A simple linear regression analysis (r^2) is made to measure the relationship between hours tutored and success rate, and GPA and success rate. Survey questionnaires were sent to tutoring program participants in Fall 2015 to measure their satisfaction with the services provided at the centers, and the learning outcomes as stated in the SLO. The surveys were analyzed using Remark Office program. Separate survey reports were generated for each of the tutoring centers. What is included in this analysis is simply the synthesis of the reports.

Analysis

Success, Retention, and Persistence Rates by Center

Success Rate:

Table One: Success Rate, Tutored, Not-Tutored, by Center

| Tutoring Center | Grand Total | Success | Success% |
|--------------------------------|--------------------|----------------|-----------------|
| Biology Tutoring Center | 2598 | 1792 | 69% |
| Not Tutored - Biology | 2031 | 1356 | 67% |
| Tutored - Biology | 567 | 436 | 77% |
| General Tutoring | 27808 | 17958 | 65% |
| Not Tutored – General Tutoring | 27092 | 17399 | 64% |
| Tutored – General Tutoring | 716 | 559 | 78% |
| Math LAB | 11422 | 5819 | 51% |
| Not Tutored – Math LAB | 10082 | 5027 | 50% |
| Tutored – Math LAB | 1340 | 792 | 59% |
| STEP | 10933 | 6685 | 61% |
| Not Tutored – STEP | 10689 | 6509 | 61% |
| Tutored – STEP | 244 | 176 | 72% |
| Writing Center | 58579 | 39394 | 67% |
| Not Tutored – Writing Center | 56687 | 37824 | 67% |
| Tutored – Writing Center | 1892 | 1570 | 83% |
| Grand Total | 111340 | 71648 | 64% |
| Not Tutored | 106581 | 68115 | 64% |
| Tutored | 4759 | 3533 | 74% |

³ **Success Rate:** Of all credit enrollments, the rate at which students completed courses with a grade of “A”, “B”, “C”, or “P”.

⁴ **Retention Rate:** Of all credit enrollments, the rate at which students completed courses and did not drop or withdraw (“W”) from them.

⁵ **Persistence Rate:** Of all degree seeking credit enrollment, how many persist from one semester to the other. (Students who received awards are subtracted from the denominator)

Success rate for the groups was calculated based on graded enrollment. Grades “A”, “B”, “C” or “P” are pass grades and classified as “Success” while “D”, “F”, “N” or “W” are fail grades and classified as “No-Success”. Overall, students who are tutored have a higher success rate compared to those not-tutored. On the average, a 10% gap observed between students who get tutored and those who did not (Max, 16%, Writing Center; Min, 9%, Math LAB).

Retention Rate

Retention Rate indicate the percentage of students who stayed to the end of the semester. Students who completed with grade other than “W” are believed to stay to the end of the semester while students with “W” drop from the course before the end of the semester. In all the cases tutored students had higher retention rates than not-tutored students (Average difference 6%; Max 12%, STEP; Min 6%, Biology, Math Lab.)

Table Two: Retention Rate, Tutored, Not-Tutored, by Center

| Tutoring Center | Grand Total | Retention# | Retention% |
|--------------------------------|--------------------|-------------------|-------------------|
| Biology Tutoring Center | 2598 | 2121 | 82% |
| Not Tutored - Biology | 2031 | 1631 | 80% |
| Tutored - Biology | 567 | 490 | 86% |
| General Tutoring | 27808 | 23146 | 83% |
| Not Tutored – General Tutoring | 27092 | 22503 | 83% |
| Tutored – General Tutoring | 716 | 643 | 90% |
| Math LAB | 11422 | 8886 | 78% |
| Not Tutored – Math LAB | 10082 | 7773 | 77% |
| Tutored – Math LAB | 1340 | 1113 | 83% |
| STEP | 10933 | 8908 | 81% |
| Not Tutored – STEP | 10689 | 8682 | 81% |
| Tutored – STEP | 244 | 226 | 93% |
| Writing Center | 58579 | 49502 | 85% |
| Not Tutored –Writing Center | 56687 | 47716 | 84% |
| Tutored –Writing Center | 1892 | 1786 | 94% |
| Grand Total | 111340 | 92563 | 83% |
| Not Tutored | 106581 | 88305 | 83% |
| Tutored | 4759 | 4258 | 89% |

Persistence Rate

Persistence is all about returning to the college to take any course in the next semester or semesters. Persistence rate is usually calculated for first time Fall degree seeking students, and covers the time from Fall to Spring and Fall to Fall. However, due to the nature of the intervention being measured, we used a modified criteria to measure persistence here. At what rate did students who get tutored in the writing center

comeback and take course in the next semester or semesters? Was the rate significantly higher than those who did not get tutored? First, students in the courses/center/ were grouped into “tutored” and “not-tutored” by semester. The unduplicated list of students of the two groups then becomes the “Group” for the persistence analysis. How many of the Group members persisted to the next semester or semesters?⁶ The analysis made indicate that tutored students have a higher persistence rate than not-tutored students in general (exceptions: Spring Group Math-LAB students and Fall Group Biology students.)

Table Three: Spring to Fall and Spring to Spring Persistence

| Group: Spring 2015 | | Spring 2015 to Fall 2015 Persistence | | Spring 2015 to Spring 2016 Persistence ⁷ | |
|--------------------------------|---|--------------------------------------|------|---|--|
| STEP Tutoring | | | | | |
| Tutored | # | 69 | 60 | 52 | |
| | % | 100% | 87% | 75% | |
| Not Tutored | # | 4377 | 2845 | 2394 | |
| | % | 100% | 65% | 55% | |
| General Tutoring | | | | | |
| Tutored | # | 351 | 223 | 184 | |
| | % | 100% | 64% | 52% | |
| Not Tutored | # | 9083 | 5439 | 4370 | |
| | % | 100% | 60% | 48% | |
| Math LAB Tutoring | | | | | |
| Tutored | # | 181 | 122 | 101 | |
| | % | 100% | 67% | 56% | |
| Not Tutored | # | 4726 | 3204 | 2638 | |
| | % | 100% | 68% | 56% | |
| Biology Tutoring | | | | | |
| Tutored | # | 370 | 262 | 224 | |
| | % | 100% | 71% | 61% | |
| Not Tutored | # | 1145 | 695 | 610 | |
| | % | 100% | 61% | 53% | |
| Writing Center Tutoring | | | | | |
| Tutored | # | 641 | 468 | 399 | |
| | % | 100% | 73% | 62% | |
| Not Tutored | # | 14003 | 8298 | 6701 | |
| | % | 100% | 59% | 48% | |

⁶ Students enrolled in other campuses or transferred to four year colleges or completed their study and received award are not taken into account in this analysis.

⁷ Spring 2016 enrollment count is based on unduplicated count of students who registered for one or more courses in Spring 2016 and did not withdraw. Data pulled from DEC on 02/08/2016

Table Four: Fall to Spring Persistence

| Group: Fall 2015 | | | Fall 2015 to Spring 2016 Persistence |
|--------------------------|---|-------|--------------------------------------|
| STEP Tutoring | | | |
| Tutored | # | 149 | 118 |
| | % | 100% | 79% |
| Not Tutored | # | 4154 | 2869 |
| | % | 100% | 69% |
| General Tutoring | | | |
| Tutored | # | 242 | 181 |
| | % | 100% | 75% |
| Not Tutored | # | 8513 | 5609 |
| | % | 100% | 66% |
| Math LAB Tutoring | | | |
| Tutored | # | 855 | 652 |
| | % | 100% | 76% |
| Not Tutored | # | 4248 | 2983 |
| | % | 100% | 70% |
| Biology Tutoring | | | |
| Tutored | # | 182 | 116 |
| | % | 100% | 64% |
| Not Tutored | # | 782 | 519 |
| | % | 100% | 66% |
| Writing Center | | | |
| Tutored | # | 916 | 736 |
| | % | 100% | 80% |
| Not Tutored | # | 14373 | 9066 |
| | % | 100% | 63% |

Success Rate by number of Tutorial Hours Received

Success rate analysis of the Academic Resource Center interventions indicated that tutored students have relatively higher success rate than the not-tutored students.

Then, a follow-up question could be whether success rate is related to the number of hours tutored, or not. To answer this question, students were grouped based on the number of hours tutored and the result plotted in a graph. A simple linear regression analysis was made by inserting a trend line to the graph. The trend line shows a positive correlation in all the cases, which means the value of y (success rate) increases as the value of x (tutorial hours⁸) increases. R Squared measures the explained variation in the relationship with that of the total variation observed. The value of R² ranges from 0% to 100%, 0% indicate the model explains none of the variability in the relationship, 100% indicates the model explains all the variability in the relationship. Overall R² is 63%

⁸ Note how success rate drops when the hours tutored exceeds 20. It looks success rate drops as students receive more than 20 tutorial hours in the program. Probably this has to do with recording of hours for some of the students. In some cases students were tutored for more than 5 continuous hours. Could this be an error in recoding the hours?

indicating that variability in success rate is more due to variability in the number of hours tutored (Max 91%, Biology; Min 38%, STEP.)

Table Five: Success Rate by Number of Hours Tutored (All Centers)

| Tutorial Hours | Enrollment | Success# | Success% |
|--------------------|---------------|--------------|------------|
| 0 | 106977 | 68417 | 64% |
| 1-5 | 2888 | 2114 | 73% |
| 6-10 | 587 | 435 | 74% |
| 11-15 | 322 | 250 | 78% |
| 16-20 | 178 | 138 | 78% |
| 20+ | 388 | 294 | 76% |
| Grand Total | 111340 | 71648 | 64% |

Chart One: Success Rate by Tutorial Hours Received, All Centers.

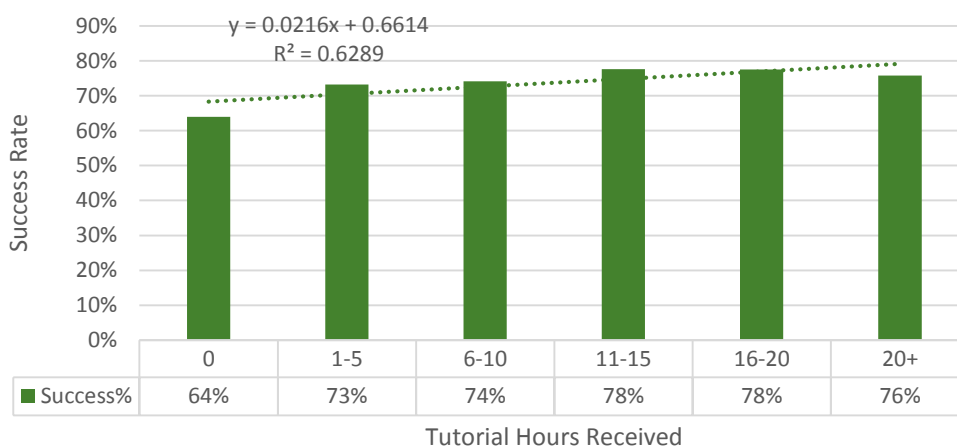


Chart Two: Success Rate By Number of Tutorial Hours Received, STEP.

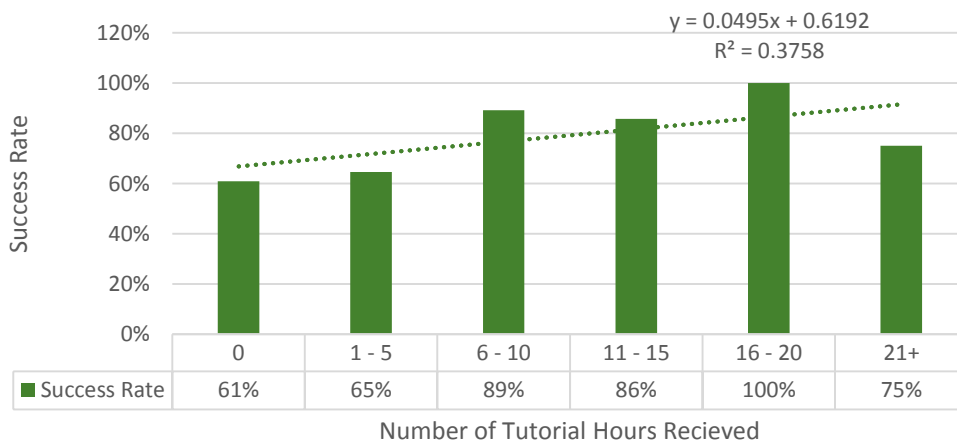


Chart Three: Success Rate by Hours Tutored, General Tutoring

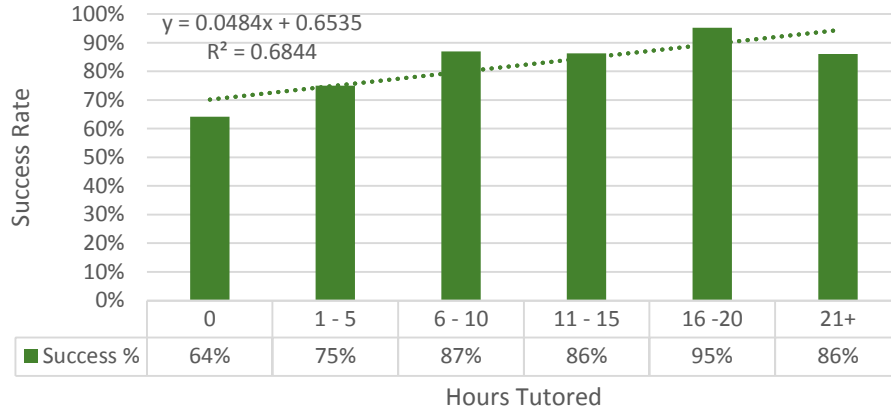


Table Six: Success Rate by Number of Hours Tutored, Math.

| Hours Tutored | Total | Success | Grand Total |
|--------------------|--------------|-------------|-------------|
| 0 | 10157 | 5067 | 50% |
| 1 - 5 | 587 | 336 | 57% |
| 6 - 10 | 230 | 130 | 57% |
| 11 - 15 | 108 | 60 | 56% |
| 16 - 20 | 88 | 52 | 59% |
| 21+ | 252 | 174 | 69% |
| Grand Total | 11422 | 5819 | 51% |

Chart Four: Success Rate by Hours Tutored, Math.

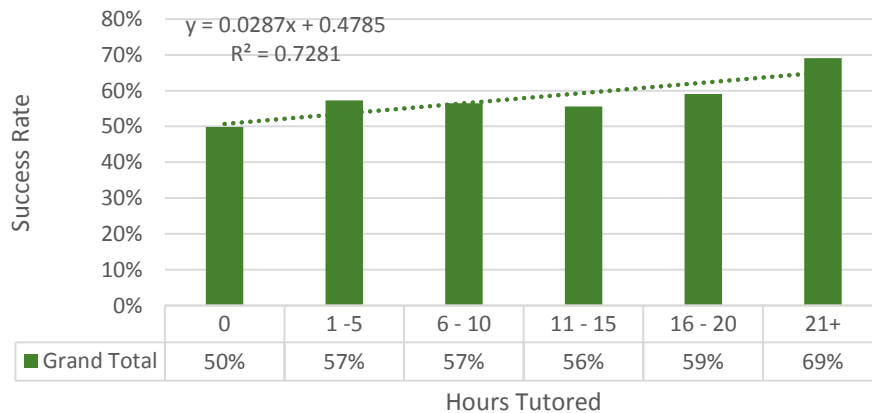


Chart Five: Success Rate by Hours Tutored, Biology.

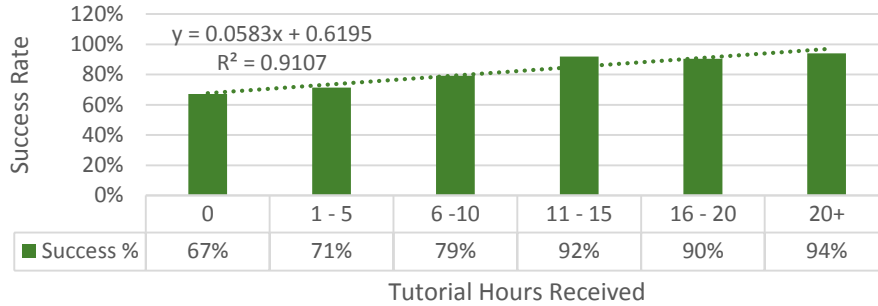
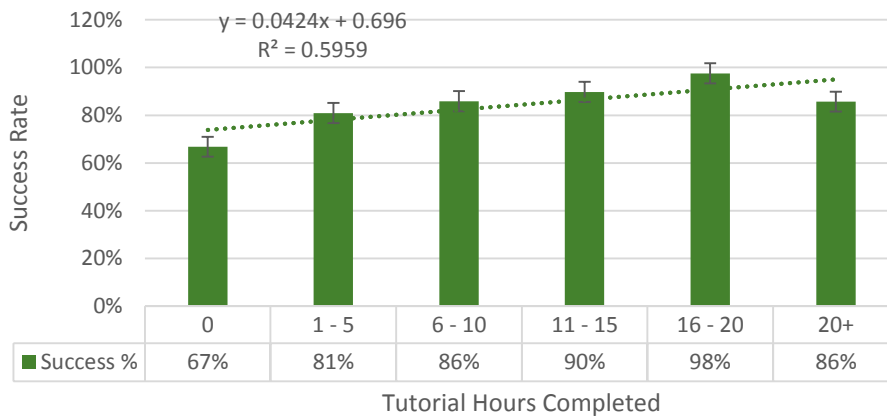


Table Seven: Success Rate by Number of Hours Tutored, Biology.

| Hours Tutored | Total | Success # | Success % |
|--------------------|-------------|-------------|------------|
| 0 | 2132 | 1432 | 67% |
| 1 - 5 | 300 | 214 | 71% |
| 6 - 10 | 58 | 46 | 79% |
| 11 - 15 | 37 | 34 | 92% |
| 16 - 20 | 21 | 19 | 90% |
| 20+ | 50 | 47 | 94% |
| Grand Total | 2598 | 1792 | 69% |

Chart Six: Success Rate by Tutorial Hours Completed, Writing Center.



Analysis of GPA and Student Success

Tutoring, at least in theory, is for students who need support to succeed. Is the Academic Resource Center providing services to needy students? Students' GPA is taken as a proxy indicator to analyze whether the Academic Resource Center is serving predominantly low achieving students or not. First, GPA of students before the beginning of the tutoring semester is calculated. Then a GPA frequency distribution table is prepared for all the students and for students participated in the tutorial services, and tested for proportionality. The analysis indicated that students with high GPA are disproportionately using the tutorial services provided by the Academic Resource Center. This is the opposite of what should happen under normal condition.

Table Eight: Tutorial Services Provided by GPA Group

| GPA Group | All Students | | Tutored Students | | Proportionality | |
|-----------|--------------|------|------------------|------|-----------------|-----|
| | Count | % | Count | % | Index | Gap |
| 0-1 | 6326 | 8% | 113 | 3% | 0.40 | -5% |
| >1-2 | 18045 | 22% | 533 | 14% | 0.66 | -7% |
| >2-3 | 31584 | 38% | 1404 | 38% | 1.00 | 0% |
| >3-4 | 27876 | 33% | 1677 | 45% | 1.35 | 12% |
| All | 83831 | 100% | 3727 | 100% | 1.00 | 0% |

Within this disproportionately serving high achieving student's, where does the highest increase in success rate happened? With students of lower GPA or higher GPA? The success rate of students who attended tutoring programs and who did not attend tutoring programs is compared for each of the GPA groups. As can be seen from the table below, tutored students with lower GPA succeed at a higher rate than students with higher GPA.

Table Nine: Success Rate by GPA Group

| GPA Group | Not Tutored | | | Tutored | | | Difference in Success Rate |
|--------------------|--------------|--------------|------------|-------------|-------------|------------|----------------------------|
| | Total | Success# | Success% | Total | Success# | Success% | |
| 0-1 | 6213 | 2099 | 34% | 113 | 62 | 55% | 21% |
| >1-2 | 17512 | 8404 | 48% | 533 | 308 | 58% | 10% |
| >2-3 | 30180 | 19008 | 63% | 1404 | 973 | 69% | 6% |
| >3-4 | 26199 | 21216 | 81% | 1677 | 1430 | 85% | 4% |
| Grand Total | 80104 | 50727 | 63% | 3727 | 2773 | 74% | 11% |

Chart Seven: Success Rate by Previous GPA

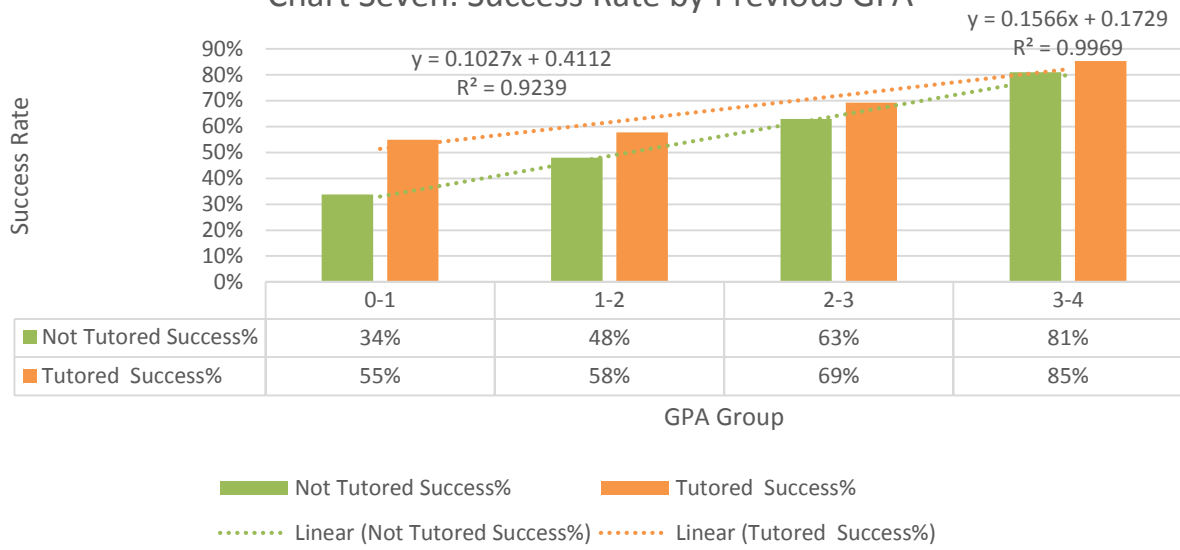


Table Ten: Success Rate by GPA Group by Center

| Center | GPA Before Taking Tutorial Class | | | | | | | | | | | |
|--------------------------------|----------------------------------|----------|----------|-------|----------|----------|-------|----------|----------|-------|----------|----------|
| | 0-1 | | | 1-2 | | | 2-3 | | | 3-4 | | |
| | Total | Success# | Success% | Total | Success# | Success% | Total | Success# | Success% | Total | Success# | Success% |
| Biology Tutoring Center | | | | | | | | | | | | |
| Not Tutored - Biology | 64 | 17 | 27% | 303 | 137 | 45% | 768 | 473 | 62% | 654 | 540 | 83% |
| Tutored - Biology | 9 | 6 | 67% | 57 | 32 | 56% | 213 | 140 | 66% | 253 | 227 | 90% |
| General Tutoring | | | | | | | | | | | | |
| Not Tutored – General Tutoring | 1540 | 537 | 35% | 4353 | 2062 | 47% | 7839 | 4898 | 62% | 6718 | 5442 | 81% |
| Tutored – General Tutoring | 10 | 3 | 30% | 75 | 41 | 55% | 240 | 181 | 75% | 260 | 233 | 90% |
| Math LAB | | | | | | | | | | | | |
| Not Tutored – Math LAB | 572 | 143 | 25% | 1706 | 546 | 32% | 2939 | 1342 | 46% | 2439 | 1712 | 70% |
| Tutored – Math LAB | 20 | 7 | 35% | 140 | 49 | 35% | 375 | 184 | 49% | 435 | 312 | 72% |
| STEP | | | | | | | | | | | | |
| Not Tutored – STEP | 825 | 268 | 32% | 1928 | 928 | 48% | 2722 | 1700 | 62% | 2189 | 1708 | 78% |
| Tutored – STEP | 12 | 8 | 67% | 29 | 19 | 66% | 71 | 48 | 68% | 66 | 56 | 85% |
| Writing Center | | | | | | | | | | | | |
| Not Tutored – Writing Center | 3212 | 1134 | 35% | 9222 | 4731 | 51% | 15912 | 10595 | 67% | 14199 | 11814 | 83% |
| Tutored – Writing Center | 62 | 38 | 61% | 232 | 167 | 72% | 505 | 420 | 83% | 663 | 602 | 91% |

Service Satisfaction

STEP Tutoring: Those who attended STEP tutoring in Fall 2015 were asked to rank the usefulness of the program from “1” to “5”, five being the most useful and one being the least useful. Accordingly, 92% of the respondents ranked the usefulness of the program as “5” and “4” (the highest and second highest in the rating scale.) Math and Anatomy sessions have relatively lower ratings than the others.

Table Eleven: Service Satisfaction Rating: STEP

| Response | Anatomy | | Biology 003 | | Math 110 | | Math 115 | | Music 111 | | All | |
|--------------------|-----------|-------------|-------------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|------------|-------------|
| | Count | % | Count | % | Count | % | Count | % | Count | % | Count | % |
| 1 | 2 | 3% | 1 | 13% | | 0% | | 0% | 1 | 5% | 4 | 3% |
| 2 | | 0% | | 0% | | 0% | 2 | 12% | 2 | 11% | 4 | 3% |
| 3 | | 0% | | 0% | 1 | 6% | 1 | 6% | 2 | 11% | 4 | 3% |
| 4 | 14 | 18% | 3 | 38% | 4 | 25% | 5 | 29% | 3 | 16% | 29 | 21% |
| 5 | 64 | 80% | 4 | 50% | 11 | 69% | 9 | 53% | 11 | 58% | 99 | 71% |
| Grand Total | 80 | 100% | 8 | 100% | 16 | 100% | 17 | 100% | 19 | 100% | 140 | 100% |

Writing Center, Math Lab, General Tutoring: Using a five scale rating method, students were asked different questions to know whether they are satisfied with the services provided or not. The ratings for each of the questions is then summarized to provide a cumulative satisfaction rate for each of the centers. 97% of the students indicated that they were satisfied or very satisfied with the services provided in the tutorial centers⁹.

Table Twelve: Service Satisfaction Rating: Writing Center, Math Lab, General Tutoring.

| Rating Scale | Writing Center | | Math Lab | | General Tutoring | |
|---------------------------------------|----------------|-------------|------------|-------------|------------------|-------------|
| | Count | % | Count | % | Count | % |
| Strongly Agree | 166 | 66% | 572 | 69% | 170 | 86% |
| Agree | 81 | 32% | 224 | 27% | 22 | 11% |
| Disagree | 1 | 0% | 20 | 2% | 3 | 2% |
| Strongly Disagree | 1 | 0% | 4 | 0% | 0 | 0% |
| Don't Know | 2 | 1% | 4 | 0% | 2 | 1% |
| All | 251 | 100% | 824 | 100% | 197 | 100% |
| Percent Agree (Strongly Agree, Agree) | 247 | 98% | 796 | 97% | 192 | 97% |

⁹ For the details, please refer to attachments 2, 3, 4, and 5.

Learning Outcomes Assessment

After completing the tutorial programs, students are expected to achieve the following two learning outcomes; (1) to be able to get a pass grade (A, B, C, or P) in the subjects they get tutored, (2) to be able to explain at least one strategy learned from their tutoring session and how they implemented it in their own learning.

Over all, tutored students in Fall 2015 got pass grades in 71% of the courses they get tutored (Writing center 83%, General Tutoring 76%, and Math LAB 56%). This is relatively higher success rate compared to LAVC average for the semester, 66%. However, not all students got a pass grade for all the subject they were tutored as stipulated in the learning outcome¹⁰.

Table Thirteen: Learning Outcomes

| Center | Students Tutored and Completed Survey | Students who identified at least one strategy learned from the tutoring | | Students who indicated they implemented the strategy in their own learning | |
|-------------------------|---------------------------------------|---|-----|--|-----|
| | Count | Count | % | Count | % |
| Writing Center | 37 | 30 | 81% | 21 | 57% |
| General Tutoring | 122 | 86 | 70% | 27 | 22% |
| Math LAB | 37 | 27 | 73% | 16 | 43% |
| Total | 196 | 143 | 73% | 64 | 33% |

From 196 students who get tutored in Fall 2015 and returned the survey, 143 (73%) indicated that they have learned at least one strategy from the tutoring they attended. 64 of the 196 students (33%) indicated that they have implemented the strategy they learned in their own learning.

¹⁰ The details by center and course can be seen in attachment one.