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**Study on the Possible Influence of an Adjunct Study Skills Course on Student Success Rate and GPA on Targeted Transfer Level Courses after Controlling for Previous Cumulative GPA, Minority Status, and Basic Skills Education**

*by*

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## Abstract

Descriptive statistics, correlation, and multiple regression analyses were used to study the possible influence that student participation in an adjunct study skills course (SKIL232), in which instruction is tailored or linked to specific course content, had on student success rate and GPA for a transfer level course. Class enrollments records (1397) for ten transfer level courses taught in spring 2009 at De Anza College were analyzed to compare groups' success rate and course GPA taking into account student participation in SKIL232, student minority or ethnicity status (identification with Hispanic, African American, Filipino, or Pacific Islander), student basic skills education (enrolled in an English, Math, or ESL course any time during the last three quarters), and student cumulative GPA for the previous quarter, winter 2009. In sum, enrollment success rates showed a difference of about 20 percentage points for adjuncts or students who enrolled in SKIL232 (81.29%), when compared to the success rate for non-adjuncts or students who did not enrolled in this course (61.25%). The difference in percentage points between enrollments for adjunct and non-adjunct students was also shown for minority students (29.44) and basic skills students (22.73). On unique variance and effect size, multiple regression analyses showed that after taking into account previous term GPA, basic skills education, and minority status, the level of participation in SKIL232 may uniquely influence content course GPA,  $p < .0001$ , with its unique effect ranging between small to medium size (r-square, 0.04). Among the main final recommendations of the study is to expand recruitment of students with lower academic achievement to expand and further study the benefits of the program.

## Introduction

The course SKIL 232, Adjunct Study Skills, at De Anza College is designed to provide “small group collaborative instruction linked to specific content courses and individualized study skill lab modules” (De Anza College, 2009-10 Catalog). Study skills such as time management, textbook reading, note taking, and test taking are taught within the context of the content course to make the instruction more meaningful or ‘in-situ,’ given that learners are able to better experience how these general metacognitive skills apply in real situations. The approach of ‘situating’ instruction within the environment in which is meant to be used is supported by the theory of Situated Cognition (Brown et al., 1989). In this specific case, students learn about content-specific study skills and are able to experience firsthand how these skills impact their learning or academic performance.

SKIL 232 is offered to students who enroll in targeted content courses being taught by participating instructors. Because instruction in SKIL 232 is based on the content course to which it is linked to, there needs to be coordination between the SKIL 232 instructor, the target course instructor, and the group leader who provides course specific tutoring. For each combination of targeted content course and instructor, a different section of SKIL 232 is offered.

With the purpose of evaluating the possible impact that student participation in SKIL 232 may have had on their academic performance on the content course (e.g., success rate and course GPA), statistical analyses were conducted in which variables such as student characteristics and previous academic performance were taken into account or used as covariates. The four main research questions addressed were:

1. *What are the differences in content courses success rates for adjunct and non-adjunct students? To what extent do these differences replicate when taking into account students’ minority and basic skills status?*
2. *To what extent student success rate and GPA in content courses can be accounted by student participation in SKIL 232, after taken into account student minority status, basic skills education, and previous academic performance as measured by previous cumulative GPA?*
3. *What group of students may benefit the most from the course SKIL 232 when taking into their cumulative GPA, basic skills, and minority status?*

## Methods

Student enrollment records for targeted content courses and SKIL 232 that were active on census date in spring 2009 were analyzed in this study. Table 1 identifies targeted content courses, title, transfer level and general education status. Attendance hours in SKIL 232 was used to identify student adjunct status (i.e., adjunct students had at least one attendance hour recorded in SKIL 232) and student level of participation in SKIL 232 (the greater number of attendance hours, the greater their participation in SKIL 232). Student success rate in the content course was based on course official grade and enrollment status. A letter grade of 'C' or higher or 'P' was defined as success, while a letter grade less than 'C,' 'NP,' 'Withdrawal,' or enrollment status equal to 'Drop' was classified as failure. Incompletes were not included in the analyses.

**Table 1.**

| <b>Adjunct Course Description, Transfer, and General Education Status</b> |                             |                               |                                 |
|---|-----------------------------|-------------------------------|---------------------------------|
| <b>Course Identifier</b>  | <b>Course Title</b>         | <b>Course Transfer Status</b> | <b>General Education Status</b> |
| <b>BIOL010.</b>   | INTRO BIOLOGY               | A                             | Y                               |
| <b>C D 010G</b>   | CHLD DEV:EARLY YRS          | A                             | Y                               |
| <b>C D 064.</b>   | HLTH,SAFETY & NUTRITION     | B                             | N                               |
| <b>ECON001.</b>   | PRIN MACROECONOMICS         | A                             | Y                               |
| <b>ECON002.</b>   | PRIN MICROECONOMICS         | A                             | Y                               |
| <b>GEO 001.</b>   | PHYSICAL GEOGRAPHY          | A                             | Y                               |
| <b>HIST017A</b>   | HIST U.S. TO ERLY NATNL ERA | A                             | Y                               |
| <b>NUTR010.</b>   | CONTEMP NUTRITION           | A                             | Y                               |
| <b>POLI001.</b>   | AMERICAN GOVT & POLITICS    | A                             | Y                               |
| <b>PSYC001.</b>   | GENERAL PSYCHOLOGY          | A                             | Y                               |

**Notes:**

Course Transfer Status: 'A' refers to transferable to UC/CSU, and 'B' to CSU only.

General Education Status: 'Y' and 'N' refers to 'yes' or 'no,' respectively, regarding the course being part of the general education curriculum at the college.

Data were also segregated by student minority status and basic skills status. Minority status classified students based on their race or ethnicity; a minority student was one of Hispanic, African-American, Filipino, or Pacific Islander race/ethnic background. Basic skills status classified students based on their enrollment history. A basic skills student was one who enrolled in at least one basic skills course in the areas of English, Math, or ESL within the last three quarters (fall 2008 to winter 2009). For the multiple regression analysis, minority and non-minority students were identified with values of 1 and 0, respectively. The same binomial scale was used for basic skills and non-basic skills, 1 and 0, respectively.

Percentage of successful enrollments divided by total enrollments was used to identify success rates by group and total. Correlational analysis was used to estimate relationship between variables and identify any possible problems with tolerance levels between predictors. The multiple regression analysis was used to identify the unique variance accounted by participation in SKIL 232 in the dependent variable, content course GPA. (See Table 2 for frequency statistics regarding student level of participation in SKIL 232, as measured by attendance hours.)

**Table 2.**

| <b>Distribution for Student Attendance Hours for SKIL 232 (Adjunct Study Skills) in Spring 2009</b> |                           |                   |
|---|---------------------------|-------------------|
| <b>Number of Attendance Hours</b>   | <b>Student Head Count</b> | <b>Percentage</b> |
| 1   | 20                        | 7.3%              |
| 2   | 1                         | 0.4%              |
| 3   | 3                         | 1.1%              |
| 4   | 4                         | 1.5%              |
| 5   | 3                         | 1.1%              |
| 6   | 3                         | 1.1%              |
| 7   | 2                         | 0.7%              |
| 8   | 2                         | 0.7%              |
| 9   | 7                         | 2.6%              |
| 10  | 3                         | 1.1%              |
| 11  | 2                         | 0.7%              |
| 12  | 47                        | 17.2%             |
| 13  | 51                        | 18.6%             |
| 14  | 64                        | 23.4%             |
| 15  | 34                        | 12.4%             |
| 16  | 21                        | 7.7%              |
| 17  | 4                         | 1.5%              |
| 18  | 2                         | 0.7%              |
| 22  | 1                         | 0.4%              |
| <b>Total Head Count</b>   | <b>274</b>                | <b>100.0%</b>     |

**Notes:**

Average of student attendance hours for SKIL 232: 12.12.

## Results

1. *What are the differences in content courses success rates for adjunct and non-adjunct students? To what extent do these differences replicate when taking into account students' minority and basic skills status?*

Enrollment success rates in content courses were, on average, significantly higher for adjunct students (enrolled in SKIL 232) than non-adjunct students—a difference of about 20 percentage points for all enrollments. (See Table 3 for details.) Although two content courses showed a lower success rate for the adjunct group, GPA (Grade Point Average) measures showed a better academic performance for adjunct students across all content courses, including these two courses. (See Table 4.)

Higher success rates for adjunct students were also found when analyzing only enrollments for minority or basic skills students; the difference in success rates between the 'minority-adjunct' and the 'minority-non-adjunct' groups was about 29 percentage points; while the difference between the 'basic skills-adjunct' and 'basic skills-non-adjunct' groups was about 23 percentage points. Success rates for the adjunct non-minority and adjunct non-basic skills groups were not as high when compared to their counterparts; however, success rates for the adjunct groups, non-minority and non-basic skills, were still above 17 percentage points when compared to respective non-adjunct groups. (See Table 5 and Table 6.)

**Table 3.**

| <b>Enrollment Success Rate by Content Course and Adjunct Status</b> |                      |                     |                    |                      |                     |              |
|---|----------------------|---------------------|--------------------|----------------------|---------------------|--------------|
| <b>Course</b>   | <b>Adjunct</b>       |                     |                    | <b>Non-Adjunct</b>   |                     |              |
|   | <b>Success Count</b> | <b>Success Rate</b> | <b>Total Count</b> | <b>Success Count</b> | <b>Success Rate</b> | <b>Total</b> |
| <b>GEO 001.</b>   | 37                   | 88.1%               | 42                 | 63                   | 50.8%               | 124          |
| <b>HIST017A</b>   | 52                   | 74.3%               | 70                 | 78                   | 38.2%               | 204          |
| <b>POLI001.</b>   | 60                   | 88.2%               | 68                 | 226                  | 63.0%               | 359          |
| <b>C D 064.</b>   | 2                    | 100.0%              | 2                  | 58                   | 75.3%               | 77           |
| <b>NUTR010.</b>   | 9                    | 90.0%               | 10                 | 56                   | 71.8%               | 78           |
| <b>ECON001.</b>   | 23                   | 74.2%               | 31                 | 46                   | 65.7%               | 70           |
| <b>PSYC001.</b>   | 12                   | 92.3%               | 13                 | 26                   | 83.9%               | 31           |
| <b>ECON002.</b>   | 13                   | 68.4%               | 19                 | 40                   | 63.5%               | 63           |
| <b>C D 010G</b>   | 7                    | 70.0%               | 10                 | 18                   | 78.3%               | 23           |
| <b>BIOL010.</b>   | 11                   | 84.6%               | 13                 | 56                   | 93.3%               | 60           |
| <b>Total</b>  | 226                  | 81.3%               | 278                | 667                  | 61.2%               | 1089         |

**Notes:**

Only includes enrollments at first census date, but excludes 5 incompletes for a total of 1367.

Success was defined as an enrollment outcome with letter grade equal or higher than 'C' or 'P.' An outcome of 'Drop' or class withdraw was defined as 'Failure.'

Table 4.

| Content Course GPA by Student Adjunct Status and Course |            |             |             |             |
|---|------------|-------------|-------------|-------------|
| Course  | Adjunct    |             | Non-Adjunct |             |
|   | Count      | GPA         | Count       | GPA         |
| NUTR010.  | 8          | 3.68        | 68          | 2.37        |
| C D 064.  | 2          | 4.00        | 63          | 2.96        |
| HIST017A  | 62         | 2.53        | 148         | 1.49        |
| BIOL010.  | 11         | 3.80        | 56          | 3.16        |
| ECON002.  | 15         | 2.95        | 49          | 2.39        |
| GEO 001.  | 41         | 2.88        | 88          | 2.14        |
| PSYC001.  | 12         | 3.93        | 26          | 3.60        |
| C D 010G  | 9          | 2.74        | 20          | 2.63        |
| POLI001.  | 63         | 2.86        | 267         | 2.41        |
| ECON001.  | 26         | 2.83        | 54          | 2.59        |
| <b>Total Enrollments</b>                                | <b>250</b> | <b>2.90</b> | <b>842</b>  | <b>2.35</b> |

**Note:**

Only enrollments with quality hours higher than zero were included.

Table 5.

| Enrollment Success Rate by Ethnic Minority and Student Adjunct Status |              |               |             |              |               |       |
|---|--------------|---------------|-------------|--------------|---------------|-------|
| Minority Status   | Success Rate | Adjunct       |             | Non-Adjunct  |               |       |
|   |              | Success Count | Total Count | Success Rate | Success Count | Total |
| Minority  | 73.97%       | 54            | 73          | 44.53%       | 110           | 247   |
| Other   | 83.90%       | 172           | 205         | 66.15%       | 557           | 842   |
|   | 81.29%       | 226           | 278         | 61.25%       | 667           | 1089  |

**Notes:**

Only includes enrollments at first census date, but excludes 5 incompletes for a total of 1367.

Success was defined as an enrollment outcome with letter grade equal or higher than 'C' or 'P.' 'Drops' and class withdraw were defined as 'Failure.'

Minority Status relates to students of Hispanic, African American or Black, Filipino, or Pacific Islander ethnic background, as reported in their admissions application.

Table 6.

| <b>Enrollment Success Rate by Basic Skills and Adjunct Status</b> |                     |                      |                    |                     |                      |              |
|---|---------------------|----------------------|--------------------|---------------------|----------------------|--------------|
|   | <b>Adjunct</b>      |                      |                    | <b>Non-Adjunct</b>  |                      |              |
| <b>Basic Skills Status</b>  | <b>Success Rate</b> | <b>Success Count</b> | <b>Total Count</b> | <b>Success Rate</b> | <b>Success Count</b> | <b>Total</b> |
| <b>Basic Skills</b>   | 72.32%              | 81                   | 112                | 49.60%              | 184                  | 371          |
| <b>Non-Basic Skills</b>   | 87.35%              | 145                  | 166                | 67.27%              | 483                  | 718          |
| <b>Total</b>  | 81.29%              | 226                  | 278                | 61.25%              | 667                  | 1089         |

**Notes:**

Only includes enrollments at first census date, but excludes 5 incompletes for a total of 1367.

'Success' was defined as an enrollment outcome with letter grade equal or higher than 'C' or 'P.' 'Drops' and class withdraw were defined as 'Failure.'

Basic skills status relates to having enrolled in an English, Math, or ESL basic skills course, as indicated by course top code, any time during fall 2008 to spring 2009.

2. *To what extent student success rate and GPA in content courses can be accounted by student participation in SKIL 232, after taken into account student minority status, basic skills education, and previous academic performance as measured by previous cumulative GPA?*

Prior to the regression analysis, bivariate correlations were computed for the variables in the regression model: previous term GPA (Grade Point Average), student minority status, student basic skills status, number of attendance hours in SKIL 232 (Adjunct Study Skills) course, and content course GPA. As shown in Table 7, the dependent variable or criterion, content course GPA, was shown to be strongly correlated to all independent variables or predictors in the model,  $p < .0001$ : previous term GPA ( $r = .44$ ), student minority status ( $r = -.16$ ), student basic skills status ( $r = -.16$ ), and number of attendance hours in SKIL 232 ( $r = -.16$ ). On average, the higher the number of attendance hours in SKIL 232, the higher the content course GPA; and, the higher the cumulative GPA in the previous term, the higher the content course GPA. As it relates to minority and basic skills status, correlation coefficients showed that, on average, minority and basic skill students attained a lower GPA in the content course, when compared to non-minority and basic skill students, respectively. Correlation coefficients among predictors showed that adjunct students had a higher cumulative GPA in the previous term, compared to non-adjunct students; and, minority and basic skills students had a lower cumulative GPA, when compared to non-minority and basic skills, respectively. Also, minority students were more likely to be identified as basic skills students.

In the multiple regression analysis, content course GPA was regressed on the linear combination of previous term GPA, student minority status, student basic skills status, and number of attendance hours in SKIL 232 (Adjunct Study Skills) course. The final model containing all four predictors accounted for 33% of the variance in content course GPA,  $F(4, 929) = 111.81$ ,  $p < .0001$ , adjusted  $r^2 = .32$ .

Standardized weights (standardized regression coefficients) and uniqueness values (the percentage of variance in the criterion, content course GPA, accounted by the predictor) were reviewed to compare the relative importance of each of the predictors in the model. Beta weights and uniqueness values on Table 9 showed that all predictors were statistically significant,  $p < .0001$ . Previous term GPA was the strongest predictor, accounting for 20% of the variance in the criterion, followed by attendance hours in SKIL 232 ('Adjunct Sections Hrs'), which accounted for 4% of the variance. Both minority and basic skills status accounted for 2% of the variance in content course GPA.

Table 7.

| <b>Pearson Correlation Coefficient for Enrollment GPA, Previous Term Cum GPA, Adjunct Sections Hours, Minority and Basic Skills Status</b> |                   |                            |                            |                        |                              |
|--|-------------------|----------------------------|----------------------------|------------------------|------------------------------|
|  | <b>Course GPA</b> | <b>Adjunct Section Hrs</b> | <b>Basic Skills Status</b> | <b>Minority Status</b> | <b>Previous Term Cum Gpa</b> |
| <b>Course GPA</b>  | 1.00              |                            |                            |                        |                              |
| <b>Adjunct Section Hrs</b>   | .21**             | 1.00                       |                            |                        |                              |
| <b>Basic Skills Status</b>   | -.15**            | .04                        | 1.00                       |                        |                              |
| <b>Minority Status</b>   | -.21**            | .04                        | .09*                       | 1.00                   |                              |
| <b>Previous Term Cum GPA</b>   | .51**             | .13**                      | -.09*                      | -.12**                 | 1.00                         |

**Notes:**

\*  $p < .001$ ; \*\*  $p < .0001$

Course GPA was calculated only for enrollments with quality points higher than zero (quality points divided by quality hours). Thus, only enrollment with an official letter grade (other than 'W,' 'P,' 'NP', or 'I') were included in the analysis.

Adjunct Sect Hrs refers to total attendance hours in the adjunct study skills course, SKIL 232.

Basic Skills Status was coded 1 for students who enrolled in an English, Math, or ESL course any time in fall 2008, winter 2009, or spring 2009; and, 0 for all others.

Minority Status was coded 1 for students who identified their race or ethnic group as Hispanic, African American or Black, Filipino, or Pacific Islander in their admissions application; and, 0 for all others.

Previous Term Cum GPA refers to the cumulative GPA up to winter 2009 for students enrolled in that term and who had a cumulative quality point value higher than 0.

Table 8.

| Beta Weights and Uniqueness Indices Obtained in Multiple Regression Analysis Predicting Content Course GPA |              |         |            |          |
|--|--------------|---------|------------|----------|
| Predictor  | Beta Weights |         | Uniqueness |          |
|  | Beta         | t value | Index      | F value  |
| 1. Adjunct Section Hrs   | 0.19         | 6.4 **  | 0.04       | 50.38**  |
| 2. Basic Skills Status   | -0.13        | -4.43** | 0.02       | 22.99**  |
| 3. Minority Status   | -0.16        | -5.41** | 0.02       | 28.08**  |
| 4. Previous Term Cum GPA   | 0.44         | 15.13** | 0.20       | 290.43** |

Notes:

\*\*  $p < .0001$

Beta weights are standardized multiple regression coefficients obtained when all predictors were regressed on content course GPA.

Course GPA (quality hours divided by quality points) was calculated only for enrollments with quality points higher than zero. Thus, only enrollment with an official letter grade other than 'W,' 'P,' 'NP', or 'I' were included in the analysis.

Adjunct Sect Hrs refers to total attendance hours in the adjunct study skills course, SKIL 232.

Basic Skills Status was coded 1 for students who enrolled in an English, Math, or ESL basic skills course any time in fall 2008, winter 2009, or spring 2009; and, 0 for all others.

Minority Status was coded 1 for students who identified their race or ethnic group as Hispanic, African American or Black, Filipino, or Pacific Islander in their admissions application; 0 for all others.

Previous Term Cum GPA refers to the cumulative GPA up to winter 2009 for students enrolled in that term and who had a cumulative quality points value higher than 0.

3. *What group of students may benefit the most from the course SKIL 232 when taking into students' cumulative GPA, basic skills, and minority status?*

Results showed that all students can benefit from the adjunct study skills course (SKIL 232), independently of their cumulative GPA, basic skills and minority status; however, SKIL 232 seemed to have its largest impact on minority students and students who had a cumulative GPA in the previous term between 2.00 and 2.99. Figures in Table 5 showed a difference of about 29 percentage points between the success rates of adjunct minority students and non-adjunct minority students in the content course. On previous term cumulative GPA, results in Table 9 showed a difference of about 29 percentage points between adjunct and non-adjunct students with a cumulative GPA between 2.00 and 2.99. In Table 6, the difference in the success rates between adjunct basic skills students and non-adjunct basic skills students was 23 percentage points.

## Conclusion

Data analyses have shown that the course SKIL 232, Adjunct Study Skills, may have influenced student academic performance, as measured by success rates and GPA in targeted content courses. SKIL 232 may have had its biggest impact on minority students, basic skills students, and those with a cumulative GPA between 2.00 and 2.99. The data also suggest that strengthening recruitment efforts to these student populations may strengthen the impact of the program. It is possible that minority status (a proxy for socio-cultural factors such as English as a second language, first generation enrolled in higher education), basic skills status, and cumulative GPA within the mid range (2.00 and 2.99) are indicators of students who are ready for this type of intervention and are ready to benefit from both a study skills course and tutoring on content knowledge.

Findings also point to the cumulative effects of previous knowledge. Previous academic performance will have, on average, a predominant role on student academic success, and will limit the potential effect of most academic interventions. Academics are, for the most part, not modular—they depend on the mastery of entry skills and knowledge (including study skills). With time, these deficiencies will likely accumulate to the point that it will be almost impossible for the students to overcome. Thus, the sooner students take advantage of needed educational interventions such as study skills and tutoring; the more likely they are to succeed in their pathway through college.

For further research, an issue to study is the degree of the impact that each component within SKIL 232, content course tutoring and study skill, may have on student academic performance. Another issue to study is the transferability of the study skills across content courses, which relates to the number of times it would be recommended for the students to take or repeat this study skill course.