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Tutorial Services UNC Asheville

-Graduate Report

Using the grant, Tutorial Services conducted quantitative and qualitative analyses to evaluate observed and perceived student academic success. The quantitative analysis used undergraduate student first semester grades in a comparative research design to examine statistical significance between students using tutoring services (independent variable) and their end of semester grades (dependent variable), for students using Tutoring services. Frequency was also measured within the treatment group and there were significant correlations between the frequency of tutoring services and end of semester grades.

Math and science courses were selected to evaluate the effectiveness of tutoring services. Students enrolled in Biology (BIO 110), Chemistry (CHEM 103 & 110) (MATH 124), and Calculus (MATH 131) were observed based on two research questions:

Research Question 1: Do undergraduate students who utilize tutoring services significantly outperform undergraduate students not utilizing them when measured by end of semester mathematics and science grades?

Research Question 2: For students within the treatment group, is there a significant relationship between the number of tutoring visits and end of semester mathematics and science grades?

Participants chosen for the baseline study were comprised of undergraduate students classified as freshman, sophomore, junior, or senior, that were identified as being enrolled for 12 or more credit hours. Only participants that earned a C, B, C+, or D were included, and those that recorded an S, W, or F were excluded from analyses. In addition to undergraduate students, student GPAs, entrance exams, and placement exams were used in determining placement of participants. Matched pairs design was used as a variable to strengthen the focus of the baseline evaluation on end of semester grades.

A Mann-Whitney U test was used to examine the difference between treatment and comparison groups. A Spearman correlation analysis was used for the first research question to determine if frequency correlates with high grades. Because tutoring visits used a ratio level of measurement and grades used an ordinal level of measurement, a Spearman correlation analysis was used.

Below, are the findings of the qualitative analysis conducted to identify dominant themes in student responses to pre-testing surveys. Also, following tables are a representation of our study conducted measuring the effectiveness of peer tutoring in AY, 2020-2021 reflecting our findings and an additional section projecting our future directions in measuring effectiveness of supplemental instruction will conclude this report.

Table 1 includes baseline demographic and descriptive data for all participants measured during the 2020-academic year. Demographic data includes gender and ethnicity. Data for treatment and control groups are identified as well.

Table 1

Baseline Participation Demographic and Descriptive Data for All Courses (AY 2020-2021)

Characteristic	BIO 110	CHEM 103	CHEM 111	MATH 124	MATH 131
Gender					
Male	t=3 c=3	t=2 c=2	t=2 c=2	t=0 c=0	t=0 c=0
Female	t=56 c=56	t=15 c=15	t=15 c=15	t=4 c=4	t=4 c=4
Ethnicity					
White	t=38 c=38	t=14 c=14	t=10 c=10	t=3 c=3	t=2 c=2
Hispanic	t=14 c=14	t=3 c=3	t=5 c=5	t=0 c=0	t=2 c=2
African American	t=1 c=1	t=0 c=0	t=1 c=1	t=1 c=1	t=0 c=0
Asian/Other	t=6 c=6	t=0 c=0	t=0 c=0	t=0 c=0	t=0 c=0
Total	n=118	n=34	n=32	n=4	n=4

Note(t=) denotes treatment group and (c=) denotes comparison group.

Table 2 includes data regarding the frequency

Table 3 data lists the results from the Mann-Whitney U statistical analysis by the mean rank and the sum of the mean ranks.

Table 3

Mann-Whitney U Results: Grade Ranks and Significance (All Courses) AY 2020-

G r o p	N	Mea	Sum Ra
0	102	96.96	9695.50
1	102	105.00	10605.50

Figure 1 displays the results of the Spearman s Rho correlation between subjects

Table 4 lists the frequency of earned grades of treatment group participants. Grades that were identified as S, W, I, or U were excluded from data analysis. Participants who received a grade of A, B, C, D, or F were also included.

Table 4

Frequency of Treatment Group (All Groups). Participant Earned Grade (A

Grade	T r e a t Frequency of Earned Grades (A				
	BIO 110	CHEM 103	CHEM 111	MATH 124	MATH 131
A=	37	11	9	5	3
B=	47	14	12	6	1
C=	33	8	10	5	0
D=	0	1	0	0	0
F=	0	0	0	0	0

Table 6 displays the frequency and percentage of treatment group participants earned each grade.

Table 6

Frequency and Percent of Treatment Group: Participant Earned Grade (A

Grade	Treatment Group Frequency and Percent
A=	24 (22.8%)
B=	30 (23.6%)
C=	32 (25.6%)
D=	18 (14.2%)
F=	12 (10.2%)
Total	116

Note: Nine participant scores not calculated by SPSS. Reason not specified. Over 72% of participants earned a letter grade or higher.

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Tutorial Services conducted qualitative analyses of surveys focused on student recorded feedback of tutoring services provided. Questions on the survey included the format of tutoring session, satisfaction with tutoring and tutor, perceived assistance and target goal reached, perceived, or observed raise in letter grade because of the tutoring session/s attended, the impact of COVID-19 on student experiences with Tutorial Services, and the probability of a student recommendation for Tutorial Services. The intent for Tutorial Services staff was to identify dominant themes that emerged from recorded responses by students from the surveys, to measure student perceptions of effectiveness of their tutoring sessions. Tables 7 through 9 display the results from student surveys throughout the 2020-2021 academic year.

Table 7

Student Feedback from In-person and Online Sessions With COVID Adjustments

with your
tutor:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Please rate the level at which you agree with the following statement:	n = 2	n = 0	n = 0	n = 12	n = 45
I received the assistance that I came to the tutoring session for.	(3.33%)	(0.00%)	(0.00%)	(20.00%)	

Survey Questions:	Yes	No
Do you feel that coming to Tutorial Services will help you raise your letter grade in your class?	n = 19 (95.00%)	n = 1 (5.00%)
After using Tutorial Services, did you observe a letter grade improvement in your class?	n = 15 (78.95%)	n = 4 (21.05%)

	Exam	Project	End of Semester Grade	Other
Was your letter grade specifically improved for an exam, project, end of semester grade, or other? (Please select all that apply)	n = 5 (31.25%)	n = 5 (31.25%)	n = 3 (18.75%)	n = 3 (18.75%)

Note: Students indicate the perceived and observed effect of Tutorial Services on their letter grade.

The baseline study conducted for this annual review was designed to effectively measure the impact of student interactions during tutoring sessions on student end of semester grades. Not included in this evaluation was a cross tabulation analysis that measured statistical significance in correlation between race/ethnicity and end of semester grades and possible correlation between gender and end of semester grades. Although these variables are important, they were beyond the scope of this study. When calculated, no statistical difference was found with gender, race/ethnicity and end of semester grades. A significantly sharp drop in attendance of TS sessions in AY 2020 was evident in the reported numbers in this document. Despite the drop in attendance, TS peer tutoring continued to have a statistically significant impact on student's end of semester grades in five courses measured. This is important to note, as major restrictions were in place during the 2020-21 academic year.

baseline evaluation, in all three groupings of data sets, students who used TS peer tutoring in the last seven semesters, consistently outperformed their peer fellow students enrolled in the same course for the first time within that semester. More importantly, the rejection of the null hypothesis for the second research question, strongly indicates that TS is outperforming the national standard posited in research and practice pertaining to the frequency of letter grades. Students who came to TS, regardless of the number of visits, earned higher semester grades than those who did not come to TS. The findings from the analysis used in answering the second research question differ from scholarship and research studies focused on frequency of letter grades, in that students from each of the seven semesters selected for this baseline evaluation, recorded A and B letter grades for all five individual subjects. This point is strengthened by, with, a large majority of students responding to surveys indicating higher earned grades in projects, exams, and semester grades.

Two recurring and dominant themes were identified through qualitative analysis of students that came seeking academic support believe that they will benefit through higher earned letter grades by attending tutoring. Second, students believe that having tutoring at TS h

Future Directions

It is with great confidence that staff at Tutorial Services believe that newly developed delivery platforms that complement existing delivery platforms, will greatly benefit students as the university moves to 100% capacity this fall. The online tutoring and instruction platforms created out of necessity in the spring semester of 2020, have become valuable options for students to benefit from, moving forward. Anticipation of student request for in-person tutoring assistance has moved Tutorial Services to prepare to receive numbers of students for in-person tutoring, and appointments for tutoring throughout the day.

Lastly, a major focus for TS staff in AY 2021 will be to evaluate TS Supplemental Instruction (SI) services, also measured through the grades using archived data and a comparison and treatment group. It is a major goal of TS to strengthen existing collaborations with faculty who partner with SI leaders to help students in class, as well as to create new collaborations based on evidence supporting the need for student access to SI support to help students successfully and independently navigate their academic journey. In addition to evaluating SI services, physics will be added to the five courses already included in this baseline evaluation for peer