

# The Effect of Delivery Modality on Student Performance in a Business Communications Course

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**ABSTRACT:** *Business Communications, BADM 230, is an undergraduate communications course offered primarily to freshman and sophomore students at a public university in Houston, Texas. This course has been taught as a face-to-face lecture-based course and as an online synchronous course with live lectures. This article explores the effect of differences in the delivery modalities, face-to-face live and online lectures, on student performance.*

**KEYWORDS:** *delivery modalities, face-to-face, synchronous*

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Date of Submission: 18-02-2023

Date of Acceptance: 02-03-2023

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## I. INTRODUCTION

The benefits and limitations of online instruction, when compared to classroom-based face-to-face (F2F) instruction, has been researched and debated for a number of years. There appears to be a blurred dichotomy between two schools of thought. There are educators who posit that the personal touch of a live instructor and F2F classroom interactions among students is essential to the college learning experience, particularly so for students whose secondary education learning experiences have not fully prepared them for college (Ramsden and Entwistle, 1981). Brown (1996) and Hara and Kling (2000) suggest that students in the online environment may experience isolation, confusion and frustration that adversely affect the efficacy of their learning.

Another school of thought advocates for online instruction suggesting that online participation may be less intimidating to students who tend to be more reserved in a classroom. McLaren (2008) advises that student learning is enhanced by the quality and quantity of interactions, both student to student and student to instructor interactions, which exist in the online environment.

Differences in student performance, in the F2F, hybrid and online environments, has also been well researched without a clear conclusion of which modality is best suited for student learning. Carmel and Gold (2007) advise that there is not a statistically significant difference in student performance between F2F and hybrid modes of instruction. Helms (2014) suggest that online students have significantly lower grade point averages (GPAs) than F2F students. Other authors advise that statistically significant differences existed in student performance between online and traditional courses (Atchley, Wingenbach, and Akers, 2010; Faux and Black-Hughes, 2000; Paden, 2006; Shoenfeld-Tacher, McConnel, and Graham, 2001).

This paper explores the existence of a difference in student performance among students taught F2F and fully online in an undergraduate Business Communications course. Student performance data from sections of the course offered F2F in Fall 2022 and online in Fall 2022 are used in the analysis. This study assumes that student performance is variable while student knowledge is fixed from semester to semester. Results of this case study may not be extendable to other larger delivery modality studies since the student performance observations in each of the two groups of data are nonrandom.

## II. DATA AND GRAPHICS

Business Communications Fall 2022 F2F	Business Communications Fall 2022 Online
69.275	74
86.28	89.18
91	77
82	84.385
57.33	86.32

83	60
87.42	87.155
90	83.19
47.375	83.25
76.225	92.105
80.005	80
83	59.23
71.495	82.37
88	83.42
87	85.59
86.29	95.145
91	86
88.665	88.295
77.12	64.115
63	73
89.24	80
78	70.29
93	79.155
78	91.265
78.31	86.08
85.465	87.195
82	89
83	77
89	79.4
78	79
90.34	96.625
70	82.205
63	88.095
87.27	74.04
61.325	92.09
94.39	82
82	84.39
71	80.49
83	84.06
	88

*Table 1: Data Sets*

Table 1 displays student performance scores for sections of the course offered F2F in Fall 2022, and online in Fall 2022. Figure 1 displays a scatterplot of the student performance data. There does not appear to be a substantial difference in the variation or the mean performance between the F2F and the online groups. Figure 2 displays a box and whiskers plot on the data. The edges of the box represent the lower and upper quartiles. Note that the interquartile range (IQR) is smaller for the online course, indicating the possibility of non-homogeneity of the variation between the groups. The question to be explored is whether that difference in variation is statistically significant.

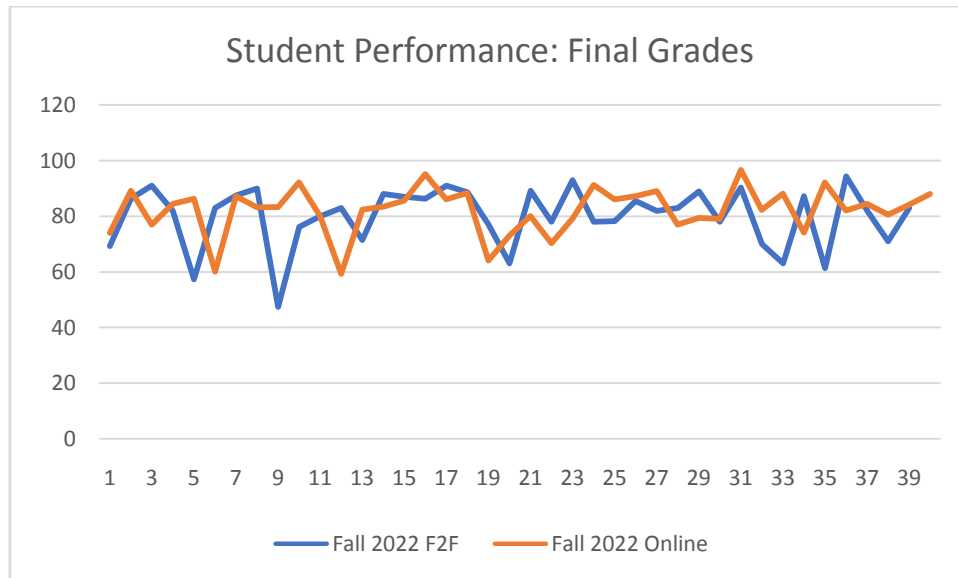


Figure 1: Scatterplot of Student Performance Scores

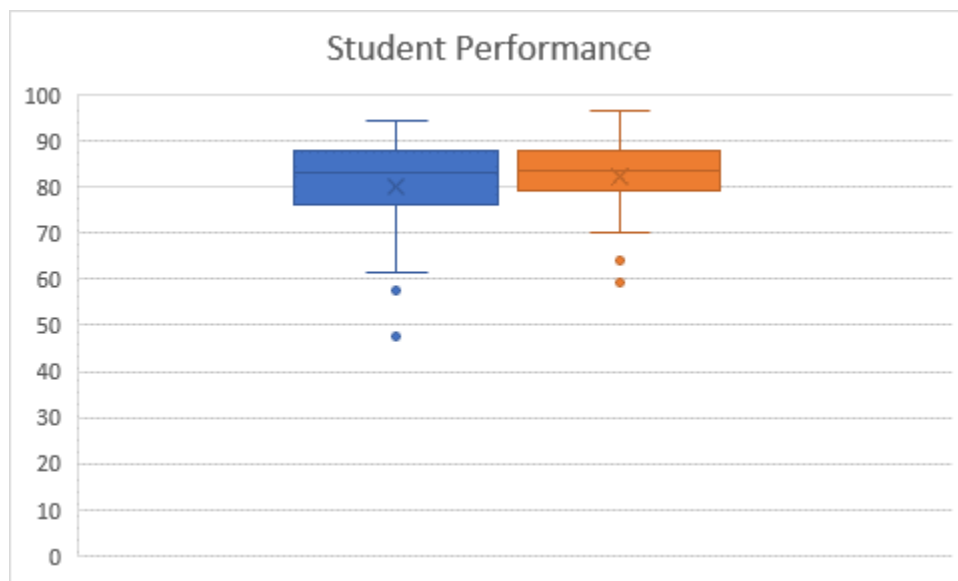


Figure 2: Box and Whiskers Plot of Student Performance Scores

### III. DATA ANALYTICS

The key research question of this study is:

Is there a difference in student performance scores of students taught F2F and in online modes?

Expressed statistically:

$H_0: \mu_{F2F} = \mu_O$  (mean student performance is the same across F2F and online delivery modalities)

$H_A: \mu_{F2F} \neq \mu_O$

Table 2 reveals the results of a test for the equality of variance between the F2F and online performance scores. With  $F = 1.608$  and  $p = 0.072$ , there is a not a significant difference in the variance between the two groups, at the 5% significance level. A pooled two-sample t test can now be applied to the student performance data to determine a difference in the mean performance scores.

In evaluating the equality of mean performance scores in Table 3,  $t = -0.9494$  and  $p = 0.3454$  indicating that there is not a significant difference in the mean between the two groups at the 5% significance level. At a 5% significance level, a statistically significant difference does not exist between the mean students' scores of students taught F2F and in online modalities.

	<i>Fall 2022 F2F</i>	<i>Fall 2022 Online</i>
Mean	80.047	82.103
Variance	114.605	71.279
Observations	39	40
df	38	39
F	1.608	
P(F<=f) one-tail	0.07217735	
	1.70873593	
F Critical one-tail		

*Table 2: F-Test for Equality of Variances*

	<i>Fall 2022 F2F</i>	<i>Fall 2022 Online</i>
Mean	80.0467	82.103
Variance	114.6056728	71.2791225
Observations	39	40
Pooled Variance	92.661	
Hypothesized Mean Difference	0	
df	77	
t Stat	-0.9494	
P(T<=t) one-tail	0.1727	
t Critical one-tail	1.6649	
P(T<=t) two-tail	0.3454	
t Critical two-tail	1.9912	

*Table 3: Two-Sample T Test Assuming Equal Variances*

#### IV. CONCLUSION

This article has explored the effect of a differences in the delivery modalities, face-to-face and online instruction, on student performance in an undergraduate Business Communication course. The results from this case study reveals a significant difference does not exist in student performance across delivery modalities. The modality of instruction, face-to-face or online, does not appear to have a significant difference in student performance in an undergraduate Business Communication course.

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Claude R. Superville, PhD, et. al. "The Effect of Delivery Modality on Student Performance in a Business Communications Course". *International Journal of Humanities and Social Science Invention (IJHSSI)*, vol. 12, no. 3, 2023, pp. 01-05. Journal DOI- 10.35629/7722