

Comparing the Learning Outcomes of Online versus Face-to-Face Formats in Teaching a Marketing Course: An Empirical Observation

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ABSTRACT

A study was conducted to compare the academic performance of two groups of university students enrolled in the Principles of Marketing course. One group of students participated in an online class, while the other group of students attended a face-to-face class. The results of the study revealed notable differences in academic performance between the two groups. The findings consistently indicated that the online students outperformed their counterparts in the face-to-face class, particularly, in the multiple-choice examinations as well as the essay-problem questions. However, the author of the study highlights a significant factor that readers should consider when interpreting these results. The higher performance demonstrated by online students may be attributed to their demographic and socioeconomic background. It was observed that the online students were significantly older, married, and came from a higher economic status compared to the face-to-face class students. Furthermore, the online students devoted nearly double the amount of time to studying, averaging 6.26 hours per week compared to 3.54 hours for the face-to-face class students in the study.

Keywords: Online Education, Face-to-face teaching, Online class, Online marketing course, Traditional teaching.

INTRODUCTION

The effectiveness of online courses compared to traditional in-person education remains a highly debated topic with no clear consensus in sight (Nagel 2009; Greer 2010). Online education has given rise to a new paradigm in college learning and degree attainment, thanks to its flexibility, convenience, and increasing acceptance. It is predicted that the number of students exclusively taking online classes will rise to 3.55 million, while the number of students attending only face-to-face courses is expected to decrease to 5.14 million (Fulton 2012).

The upward trend in online education is not limited to the United States, as online enrollments are growing significantly faster than those in traditional higher education worldwide. For instance, Chabot College reported an 8% increase in online enrollments, rising from 14% in 2015 to 22% in 2019, prior to the COVID-19 pandemic. During the same period, face-to-face enrollments declined by 10%, dropping from 83% to 73% (Chabot College 2020). In the fall semester of 2007, the number of online students reached 3.94 million, reflecting a

12.9% increase from the previous year. Recent statistics indicate that 42% of students pursuing a bachelor's degree and 27% of those working towards a doctorate enrolled in online courses (Vlasova 2020). While these growth figures are specific to the United States, even larger numbers have been reported for institutions outside the U.S. (Allen 2007; The Sloan Report 2010).

Initially skeptical about the quality and validity of online courses, the author's views underwent a considerable shift after teaching both online and face-to-face marketing courses simultaneously. The primary concern was whether differences in quality between the two delivery methods would impact the learning experience in online courses compared to traditional face-to-face classes. However, despite the rapid growth of online courses offered by traditional universities and online campuses, the debate on the pros and cons of online vs. traditional courses does not show a sign of ending in the near future (Nagel 2009 and Greer 2010). The flexibility, convenience, and increasing acceptance of online education are creating a new phenomenon in how college students learn and earn their degrees.

PURPOSE OF THE STUDY

This study deals with empirical observations of two-course offerings: online and face-to-face, compared side by side with the maximum control of course-related variables that include: the instructor, examinations, assignments, exercises, quizzes, and other contents of the courses. For this study, the main focus has been on the four examinations proctored in a real classroom setting.

HYPOTHESIS

The study designed hypothesis testing at two different stages: one general hypothesis and four specific examination hypotheses. The general hypothesis was based on the letter grades given to each of the two courses, while the specific four hypotheses were created for each examination proctored physically in the classroom. Table 1 below shows the scheme for setting the four specific hypotheses.

Table 1

	Multiple Choice	Essay with Problems
Examination 1	H1	H2
Examination 2	H3	H4

General Hypothesis

Ho: There is statistically significant difference in the academic performance between the students in an online class and those in a face-to-face class in the case of Principles of Marketing course.

Four Specific Hypotheses

- H1: There is statistically significant difference in the scores of the first multiple-choice examination between students in an online class and those in a traditional class in the case of Principles of Marketing course.

- H2: There is statistically significant difference in the scores of the first essay examination between students in an online class and those in a traditional class in the case of Principles of Marketing course.
- H3: There is statistically significant difference in the scores of the second multiple-choice examination between students in an online class and those in a traditional class in the case of Principles of Marketing course.
- H4: There is statistically significant difference in the scores of the second essay examination between students in an online class and those in a traditional class in the case of Principles of Marketing course.

METHODOLOGY

Observation

The Principles of Marketing course was taught by the same instructor for two years in two different class formats: online and face-to-face. In the middle of the first semester in the online class, he started to notice these students might be doing better than those in the face-to-face class. At first, the casual observations revealed the online students scored better in multiple choice questions and the assignments submitted were of far better quality than those done by the students in the face-to-face class. This curiosity led the author to experiment with the two different delivery modes using identical performance measures in multiple choice examinations and essay questions. For this report, the four examinations have been used for the analysis that includes multiple choice as well as essay questions.

Research Design

During the Spring semester four examinations were scheduled for the two courses. Each examination weighed 100 points toward the final course grade; 90 points for multiple choices and 10 points for essay problems. There were 50 multiple-choice questions for each examination. The format of all four examinations was same throughout the semester to objectively measure their differences. Ten points of the examination was devoted to essay and reasoning questions to measure conceptual and analytical skills. The questions on the essay parts, as well as the multiple-choices, were identical for both types of course offerings throughout the semester.

Implementation

Blackboard Learn 9 was the main platform as a channel of communication for the courses. Through this mechanism, multiple-choice quizzes were administered, grades were kept up-to-date, and the syllabus, future exercises and assignment were posted. Adobe Presenter, as well as Panopto Focus Content, was utilized for recording voice lectures of each of the 17 chapters covered in order. Online students were expected to have a computer accessible to the university computer system's Blackboard Learn 9. Online students submitted their work through e-mails; some assignments were sent by Blackboard. All the works of the face-to-face class students were collected in the classroom.

Data Collection

The data used for testing these hypotheses was collected throughout the semester from the two sections of Principles of Marketing: one online and the other face-to-face. The data

consists of two sources; the grade book monitored by the instructors and the two-page questionnaire that contained demographic questions and course related questions.

All course data was collected by the end of the semester in the classroom prior to starting the final examinations. All four examinations were proctored in the classroom for the online class as well as the face-to-face class. Four examinations were the only occasions in which the instructor had face-to-face contact with the online students throughout the entire semester, unless any of the students paid a visit to the instructor's office. E-mail was the main channel of communication for any questions related to the study. Telephone calls were also made but infrequently.

As shown in Table 1, the total number of students participating for the study is quite uneven between the two: online and face-to-face. Regarding the differences in the class size by gender, the online

Table 1: Class Type by Gender

Class Type	Male	Female	Total
Face-to-face	21 (55.3%)	17 (44.7%)	38 (100.0%)
Online	10 (43.5%)	13 (56.5%)	23 (100.0%)
Total	31	30	61

class had a total of 23 students enrolled, a much smaller number than 38 students in the face-to-face class. In terms of gender, the online class had slightly more female students (56.5%) than male students while the opposite composition was true for the face-to-face, which had more male students (55.3%). Many studies indicate that female students prefer online classes or even remotely working at home to face-to-face classes. One study related to gender differences in online learning shows that in one graduate education course, female students (n=162) outnumbered males (n=31) and in which female students perceived learning more than their male peers (Baker 2005). However, for this study, when the two classes are aggregated as one group, the gender distribution becomes very much even between males and females (31 vs. 30).

Issues in the Quality of the Data

The initial idea of inquiring about the differences between the two different teaching methods was a priori the second time teaching an online and a face-to-face course simultaneously. All the data for the two courses for the first year was available but no demographic data for the students are absent in this analysis. For this study, all the demographic characteristics of students are from the second time teaching the two courses: one online and one face-to-face course.

ANALYSIS OF THE STUDY GROUP

The 23 students taking the online and the 38 students in the face-to-face class were compared in terms of demographics, academic backgrounds, and work-for-earning characteristics. Occupational characteristics were especially important for this study. It is well understood that a significant factor related to academic success is the number of hours a student study. As the number of hours, a student works for money increases, the students

may generate more earned income to cover school expenses. However, there is a trade-off in which more work hours for money allow less time available for the students to study.

Demographic Profile of the Students in the Study

As shown in Table 2, the students in face-to-face class are more likely to be single (79.0%), compared to those in online class where only 52.2% are singles. A smaller number of students in the face-to-face class are married than those in online class (21.0% vs. 43.5% for online students). To put it in a simple way, the face-to-face class has more singles, while the online class has greater number of married students.

There is a significant difference in the number of children they have among the married students. The married students in face-to-face class have less than 1 child (0.26) in the class average, while those in online class had 1.78 children per married student. Many of the students for both class type are residents of the state (92.1% vs. 91.3%), but a slightly higher number of the students in the online class are from the outlying areas (26.3% vs. 34.8%).

Another significant difference is age. The online students are much older with an average of 30.17 years compared to 22.94 years old of those of face-to-face class.

Table 2: Demographic Characteristics of the Study Group

	Face-to-Face Class	Online Class	Remarks
Gender (Female)	44.7%	56.5%	
Married	21.0%	43.5%	
Single	79.0%	52.2%	
Residents of the State	92.1%	91.3%	
Residents of the City	26.3%	34.8%	
Age (years old)-a	22.94	30.17	Significant at 0.001
Children in number-b	0.26	1.78	Significant at 0.021

Note: Married online students had 1.78 students in average. F-value of 28.830 b. F-value of 5.609

Academic Backgrounds of the Sample

Table 3 reveals that the students in online class devote significantly more hours to studying the course than those in face-to-face class. The difference between 3.54 hours and 6.26 hours is significant at 0.0001. In terms of the credit hours accumulated for baccalaureate degrees, the online students have earned about 11 credit hours more than the face-to-face class students.

Further, relying on the information in the previous table, it can be stated that for this study the online students tend to be older, more likely to be married, and have earned a greater number of accumulated credit hours.

Online students report that they study an average of almost twice as many hours per week, 6.26 hours compared to the mere 3.54 hours of study by the students in the face-to-face class.

Table 3: Academic Background

	Traditional Face-to-Face Class	Online Class	Remarks
Credit Hours Accumulated	78.66	89.56	
Hours of Study for the Course per week-a	3.54	6.26	Significant at 0.0001

a. F-value of 9.014

Work for Earning Characteristics

The information in Table 4 sheds some light on their work style and financial situations. Compared to the face-to-face class students, the online students hold more full-time jobs (47.6% to 29.4% of the face-to-face students), do more office work as managerial jobs (71.4% to 52.9% of the face-to-face), and earn substantially more money than the students in the face-to-face (\$1753.61 to \$1015.85 of the face-to-face class students). The earning difference is significant at 0.069.

Table 4: Work for Earning

	Traditional Class	Online Class	Remarks
Hours of Work/week	24.5	29.9	Significant at 0.007
Full Time (Part time)	29.4% (70.6%)	47.6% (52.4%)	
Office work (Manual)	52.9% (47.1%)	71.4% (28.6%)	
Managerial (Clerical)	41.2% (58.8%)	55.0% (45.0%)	
Earnings per month	\$1015.85	\$1753.61	Significant at 0.069

** The statistics in parenthesis are for part-time, manual, and clerical.

HYPOTHESIS TESTING:

Two Stage Testing

The First Stage - General Hypothesis:

The general hypothesis stated, "There is statistically significant difference in the academic performance between the students in an online class and those in a face-to-face class in the case of Principles of Marketing course" was tested in the first stage.

The letter grades for the course were used for the first stage to test the general hypothesis, while four specific hypotheses have been generated from each of the examinations in the multiple choices and the essay problems were used for detailing of the hypothesis for specific analysis.

The first stage of testing by Chi-Square analysis is shown in Table 5. The significance level at 0.010 with Pearson Chi-Square value of 7.203 is highly significant to accept the general hypothesis, and we conclude that in the study sample of two classes, there is significant difference in academic performance between the two classes; the face-to-face class and the online class to indicate that the students in the online class of Principles of Marketing performed significantly better on examinations than those in the face-to-face class.

Table 5: Chi-Square Hypothesis Testing by Letter Grades: General

	Total to Begin	A	B	C	D	F	Total to Finish	Completion Rate (C or higher)	Remarks
Traditional % within % of Total	45	4 10.5% 6.6%	16 42.1% 26.2%	12 31.6% 19.7%	5 13.2% 8.2%	1 2.6% 1.6%	38 100.0% 62.3%	71.1% (32/45)	45 students enrolled at the beginning of the course. Minimum grade of C is required for the marketing degree.
Online % within % of Total	29	7 30.4% 11.5%	12 52.2% 19.7%	3 13.1% 4.9%	1 4.3% 1.6%		23 100.0% 37.7%	75.9% (22/29)	29 students enrolled at the beginning of the course. Minimum grade of C is required for the marketing degree.
Total Count % within		11 18.0%	28 45.9%	15 24.6%	6 9.8%	1 1.6%	61 100.0%		Significant at 0.010

Note: Pearson Chi-Square 7.203 in the minimum expected count of .38 with 5 cells (50%) have expected count less than 5.

Table 5 offers the performance measures of the students in the two types of courses. First, online students received higher letter grades than those in the face-to-face class. More than 80% of the online students received an A or B, while a little over 50% of the face-to-face students earned an A or B. There was one student who failed in the face-to-face class but there was none in the online class. As to the course completion rate, the total number of students that finished the entire semester is much higher for the online class (75.9% vs 71.1%). The traditional face-to-face class started with 45 students for the semester, but by the end of the semester, 7 students dropped the course to result a drop rate of 15.6%, while in the online course 29 students started the course and 6 students dropped the course to result the drop rate of 20.7% that was much higher than the drop rate of face-to-face class. In terms of the impact of those who exited the course before it finished, the higher drop rate in the online course may have left more competent students remaining in the class which could have accounted for the higher performance by the end of the semester.

Regardless of the student characteristics, for this study, based on their performance in the four examinations, we can conclude that the students in the online class tend to perform better than those in the face-to-face class in the study of Principles of Marketing. This result supports to rejecting our general hypothesis.

The Second Stage-Specific Variable Hypothesis Testing:

To confirm and reassure the result of the general hypothesis tested by Chi-Square, a range of T-Tests were performed. To reinforce our rejection of the null, general hypothesis stated, the study states in an alternative form. Table 6 shows the mean score differences and significance of each of the examinations for the multiple-choice parts and essay-problem parts.

Table 6: T-Test Hypothesis Testing of the Four Examinations

Semester	Examination	Face-to-Face Class	Online Class	Difference	Leven's F Value	Significance
Semester 1	EXAM 1 Multiple Choice	32.63	34.86	2.23	0.666	.418
	EXAM 2 Multiple Choice	32.26	33.17	0.91	0.009	.925
	Exam1 Essay-a	9.36	11.21	1.85	2.844	.098
	Exam2 Essay-a	7.89	9.13	1.24	3.730	.058
Semester 2	EXAM 1 Multiple Choice	35.11	37.56	2.45	0.921	.341
	EXAM 2 Multiple Choice	29.13	32.56	3.43	2.522	.118
	Exam1 Essay	6.40	8.47	2.07	1.986	.164
	Exam 2 Essay-a	6.97	8.52	1.55	2.753	.100

Note: a Significant at 0.10 or better

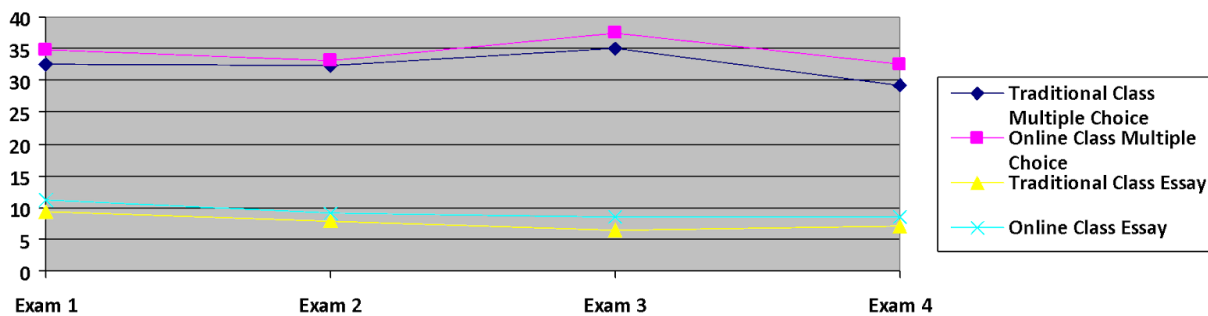
Each of the four examinations during the two semesters consisted of 50 multiple choice questions, and essay questions in a separate part which were used as the evaluation measurement in each of the two classes. The statistics in the table are the number of right answers out of the 50 multiple choice questions. An exam score of 32.63, for example, means 32.63 were correct out of 50. The essay part of the examination was graded on the 10-point scale, except for Exam 1 Essay which was graded on the 12-point scale.

Contrary to a belief held by some that online courses are inferior and easier compared to face-to-face courses, the students in the online classes have earned higher grades than those in the face-to-face class. The readers of this study are reminded that exams in both classes were administered in a consistent manner. All the examinations for the online class and the face-to-face class were proctored in a physical classroom setting on the same dates – the only variation was a slightly different time of the exam date. For example, the online students took the exam on Thursday 4:30 PM, but the face-to-face class students took the exam 11:00 AM on Wednesday.

Even though the level of significance is not solidly high, the differences in the four examinations are consistently evident that the online classes have shown higher scores in the multiple choices as well as in the essay part as depicted in Graph 1 below. Therefore, based on the two-stage testing of the hypothesis and the consistent score differences in the examinations, it deems safe to say that there are significant differences in the academic performance between the two types of course offerings for Principles of Marketing

course. The study indicates that the students in online class do better than those in the face-to-face class.

However, there is a caveat to this conclusive statement. The performance differences in the four examinations may not stem from the type of class offered but from the demographic and socioeconomic differences of the students in the two types of classes. When we look at the information in Table 2, Table 3, and Table 4, there are apparent characteristic differences in the students enrolled in these two classes. Online students tend to be older and more likely to be married with children, and they hold full time jobs making significantly more money. Further, the online students for this study had accumulated more credit hours toward their baccalaureate degree. The online students show, by far, more maturity, greater family and career commitments. They seem to be more focused and more responsible as they approach their academic work than face-to-face class students who are younger, single, and many of whom are holding only part-time jobs.



Graph 1: Scores of the Four Examinations

Source: Table 6

This caveat warrants further study and clarification to deal with the learning outcome analysis of online vs. face-to-face class offerings. In spite of the performance differences, the analysis has led to the author become more inquisitive raising questions for further investigation.

DISCUSSION

There are numerous avenues to advance research and discussion on comparing the learning outcomes between online and face-to-face classes. This study serves as an initial phase of a longitudinal research endeavor. With each successive semester, the study can encompass a larger student population, leading to more robust and valid data. Additionally, by identifying and racking various demographics and psychographic factors, we can gain further insights into potential factors influencing learning success. Collecting student data on metrics such as the number of online courses taken, satisfaction levels with online courses, reason for choosing online courses, barriers to taking online courses, completion rates of online courses, and gathering feedback from students on features, supplements, and assignments that could enhance the online learning experience would be valuable.

As the availability of online course offerings continues to expand, resulting in an increase in the number of online degrees earned, there is ample opportunity to investigate any discernable differences in recruitment, hiring practices, and subsequent career trajectories between graduates from online and face-to-face degree programs. Taken together, it is evident that there are numerous prospects for researching the learning and career outcomes associated with online education.

CONCLUSION AND IMPLICATIONS

It is premature to make a generalized conclusion that online classes are inherently superior to face-to-face classes. Currently, there has been a lack of comprehensive testing and research on the claims comparing these two modes of course delivery. The initial observation made by the author tentatively suggests that, in the case of Principles of Marketing courses, students in online classes may outperform those in face-to-face classes to some extent. However, it is important to consider that this effect could be influenced by demographic and socio-economic differences between two student groups.

These findings align with the research presented in “The U.S. Department of Education, Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.” This Meta-analysis, which included 50 study effects, predominantly focused on older learners. On average, students in online conditions exhibited a modestly better performance compared to those who learned the same material through traditional face-to-face instruction (U.S. Department of Education 2010).

Not all research agrees entirely with the conclusions drawn from this study and that of the U.S. Department of Education. However, there is shared optimistic outlook. The Ithaca study, for example, found “no statistically significant differences in learning outcomes between students in the traditional face-to-face and hybrid format section.” Furthermore, they acknowledged the tremendous potential of online learning systems, anticipating significant improvements over time, which could lead to enhanced learning outcomes (Bowen, Chingos, Lack, and Nygren, 2012).

Looking ahead to the future implications of the increasing shift toward online delivery of educational opportunities, several issues will come into play in ongoing discussions (Carron 2006). With the rise of Massive Open Online Courses (MOOCs), particularly with collaboration with universities and outside providers, the measurement of student learning outcomes achieved in a mass delivery format becomes both pertinent and challenging.

With the expanded offerings and availability of online courses many questions will enter the discussion. Do online courses provide the comparable rigor as face-to-face classes? Do online courses meet the educational needs of all students? In other word, can we have one size that fits all? Will online courses be offered to any or all undergraduate students? Considering the higher level of failure to complete online courses, what efforts will be made to assess student readiness for online courses? Aside from completing the course work and earning a grade, what might students have been missing from the online courses compared to traditional face-to-face course experience?

As online and other alternative methods of educational learning options continue to emerge – the possibilities of engaging millions of people in the learning process outside the traditional face-to-face paradigm are infinite. The long-term outcome of a greater number of individuals having easier access to a variety of learning opportunities has the potential to improve the quality of life and raise the standard of living for current and future generations.

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