

Differences in Student Evaluations from Hybrid and Traditional Courses

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ABSTRACT

Hybrid courses contain online elements in combination with reduced in-class seat time. This study examines differences in student evaluations from hybrid and traditional sections of an introductory course in economic and business statistics. In our hybrid course, face-to-face lectures are replaced with online lectures and class periods are conducted as question-answer and practice sessions. We find strong evidence that students mark down evaluation scores in the hybrid versus traditional format. Markdowns occur across all dimensions of the evaluation instrument.

Introduction

Rapid advancements in technology have created many options for organizing courses and delivering learning materials to students. At one extreme is the fully online format. We consider the other extreme to be the traditional face-to-face format where regularly scheduled class meetings are mainly taken up by lectures. The course format of primary interest in this study lies between the two extremes and goes by any of several labels including blended or hybrid. The latest report on distance education from the National Center for Education Statistics (IES) defines hybrid courses as offerings that include *a combination of online and in class-instruction with reduced in-class seat time for students* (Parsad and Lewis 2008, p. 1). The IES report indicates that 35 percent of the 4,160 2-year and 4-year institutions examined offered hybrid courses at either the undergraduate or graduate/professional level. The report found that the percentage of institutions offering hybrid courses increases with institutional size and the public nature of institutions. Overall, more than half of the public institutions examined offered hybrid courses, while 64 percent of institutions with more than 10,000 students rely on this instructional method of delivery (Parsad and Lewis 2008, p. 6).

A recent study conducted by the U.S. Department of Education (2009) identified over one thousand empirical studies of online learning since 1996. The majority of these studies attempt to measure student learning outcomes in online and hybrid courses versus the traditional face-to-face classroom setting. While the impact of online, hybrid, and traditional formats on student performance has been extensively studied, the impact of these delivery methods on student evaluations of teaching (SET) scores has received far less attention and the few findings available are mixed.

The purpose of this study is to examine and compare the SET scores in an introductory economic and business statistics course taught using hybrid and traditional formats. As the popularity of hybrid courses grows, it is important to know the attitudes and impressions that students are forming about the format. Also, instructors need to be aware of possible changes to their usual pattern of SET scores if they are considering a move from traditional to hybrid courses. Although their importance varies by type of academic institution (Becker and Watts 1999), SET scores are often used as ingredients in annual performance evaluations and in promotion and tenure decisions. Therefore, an instructor's choice to move from the traditional toward hybrid format may carry monetary and career risks if the impact upon SET scores from the move is negative.

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Literature Review

The extensive literature on SET scores for traditional delivery methods began in the 1930's with an article by Heilman and Armentrout published in the *Journal of Education Psychology*. The research findings since the publication of that article, however, have been controversial, often opposite and many times questioned due to statistical shortcomings, data problems, and the use of different instructional methods. In fact, unobserved heterogeneity seems to be the most prominent issue found in SET studies (McPherson 2006). Student evaluations of teaching for online and hybrid courses are beginning to receive more attention as online learning and technology usage continue to increase in higher education. Studies examining the differences in SET scores between online courses and traditional settings have found negative or insignificant differences for online delivery (Rovai et al. 2006, Farinella 2007, Tesone and Ricci 2008). The findings of the few studies available for hybrid courses are mixed but tend to fall on the side of showing negative effects upon SET scores when compared to the traditional mode of instruction. Below, we provide summaries of five studies in chronological order.

Rivera and Rice (2002) compared the satisfaction of students enrolled in traditional, hybrid, and web-based sections of an Introduction to Information Systems course. Their hybrid section had in-class lectures, a feature that is quite different from the hybrid course examined in our study. The format of their web-based section more closely resembles our hybrid course. The web-based section had the following characteristics: the nature of the instructional method was not clearly revealed in course catalogs or advance registration materials; course materials including lectures and lecture notes were delivered online; the course offered a weekly class meeting focused on reviewing course assignments. The authors found that students enrolled in the web-based section were less satisfied than students participating in the traditional section by .57 points on a 5-point Likert scale.

Gutierrez and Russo (2005) compared the performance and SET scores of students participating in three Introduction to Business courses delivered in face-to-face, online, and hybrid formats, respectively. The same instructor taught the three courses and identical assessment methods were used to evaluate students. However, a description of the characteristics of the hybrid course (content, details of delivery methods, degree of student/instructor contact, etc.) was not provided by the authors. While students in the hybrid course outperformed those in the traditional course grade wise, the SET scores were three to nine percentage points lower across the seven dimensions used in the evaluation instrument. The SET score on the "Overall" dimension was six percentage points lower in the hybrid course than in the traditional course. Interestingly, students in the hybrid course rated the course organization lower by eight percentage points versus students in the traditional setting. These less favorable perceptions of the organization for the hybrid course may have contributed to the lower overall evaluation of the instructor.

Pereira et al. (2007) examined the overall SET scores of first-year students participating in hybrid and traditional sections of introductory human biology. Their hybrid version replaced approximately one-third of the traditional lectures with online materials and non-attendance-based activities. Online support and student forums were also incorporated. While students enrolled in the hybrid offerings seemed to be slightly more satisfied with their educational experience than traditional students, the difference in overall satisfaction was not significant. The authors found, however, that students participating in the hybrid courses were significantly more satisfied with the teaching materials than those in the traditional sections.

Senn (2008) examined hybrid and traditional versions of a graduate course in Design and Development Tools aimed at teaching students how to use a variety of software packages to design educational content. The hybrid course had the following characteristics: all course materials were delivered through websites; five face-to-face meetings were held to demonstrate the use of software tools; final group presentations were held at the end of the course. The author controlled for instructor effects by having the same instructor teach the two courses. There were significant differences between the SET scores in the traditional and hybrid courses. Specifically, the impact from teaching the hybrid course versus the traditional course was found to be negative. The overall evaluation for the hybrid course was .6 points lower than for the traditional course on a 6-point Likert scale.

Finally, Melton et al. (2009) compared the SET scores from four sections of a general health course, one section being taught in the traditional format and three sections being taught in a hybrid format (they preferred the label "blended"). In-class and online portions were involved in the hybrid format. The online portion contained PowerPoint presentations and note sheets, homework assignments, and quizzes. The in-class portion had weekly meetings that included a brief lecture and a variety of learning activities such as discussions, worksheets, and group projects. The overall instructor rating in the hybrid sections was higher

than in the traditional section by .59 points on a 5-point Likert scale. Two factors might have contributed to the finding of the positive effect. First, graduate students with varying levels of teaching experience taught the four sections so variations in instructional quality may have been present. Second, the lone section that followed the traditional format had 153 students enrolled whereas none of the three hybrid sections had more than 40 students enrolled. The ambiance of smaller sized classes for the weekly meetings in the hybrid sections may have created a natural advantage as concerns instructor evaluations.

Data

In this study, we compare SET scores and patterns from hybrid and traditional versions of an introductory course in economic and business statistics. The course is a staple in many business schools. Our data comes from four sections of the course that were taught at a public university by the same instructor during the Fall and Spring semesters of the 2008-2009 academic year. Thus, instructor-specific effects and complications arising from mixing data from multiple instructors are not a concern in this study design. Two sections were taught using the hybrid format and two sections were taught using the traditional format. Each of the four sections were part of the regular teaching load for the instructor. The course is required of all economics and business students and carries a credit hour prerequisite of sophomore standing (27 credit hours) or above. Course prerequisites are business calculus and successful completion of a computer proficiency course.

The traditional course followed a face-to-face lecture format with lectures being delivered semi-weekly during class periods of 75 minutes. In contrast, the hybrid course had the following characteristics:

1. No lectures were given in person by the instructor. Lectures were available online via the Blackboard course management system. The lectures consisted of PowerPoint slides with audio narrations by the instructor. Narrations were created with the Adobe Presenter software. Lectures were organized according to section numbers in the chapters of the course text, thereby allowing the lecture material to be segmented in a manner similar to what the students experienced when working with the text. Students could easily select specific topics within chapters for extra attention and drill down to specific slides and instructor narrations.
2. Semi-weekly class periods, 75 minutes in length, were conducted by the instructor as question-answer and exercise-solving sessions. No in-class lectures of any type were delivered during the class periods. Students were provided with a progress schedule at the beginning of the course showing the recommended pace to be followed for the semester. The progress schedule specified the online lectures that should be listened to prior to each class period and also gave lists of suggested exercises in the text to be practiced. Questions concerning the most current material were given priority in the sessions. Once priority questions were answered and discussed the floor was opened for questions from earlier material.

The hybrid and traditional courses used the same text and both shared the following organizational characteristics:

1. Four exams were required during the semester and were administered only during the 75-minute class periods. Exams were not available online nor in any auxiliary facility such as a testing center, etc. All sections had exams that were similar in terms of format and coverage. Sections being taught in the same semester were given their exams on the same days. Intermittent computer homework using spreadsheets was also required. The homework was common to both sections but all students received randomized data sets so that answers were unique to each student.
2. Identical lists of suggested exercises in the text were provided to all students for practice.
3. Student absences were not penalized.
4. The nature of the instructional method was not revealed in course catalogs or advance registration materials.

The hybrid format outlined above gives students a broad spectrum of choice as to how they will take the course. By eschewing the semi-weekly class sessions, a student can effectively turn the hybrid course into an online course, with the exception that exams are taken in the classroom on a specific date rather than online. At the other extreme, the student can create an approximation to the traditional course format by regularly attending all semi-weekly question-answer sessions. In fact, regular attendees can avail themselves of a double dose of instruction by working through the online lectures in a timely manner and then supplementing their learning activities with the question-answer sessions.

Descriptive statistics for various characteristics of the students are given in Table 1. Also shown is the test statistic for comparing means or proportions between the two courses. There were 117 students in the hybrid course and 163 students in the traditional course. Student *Age* was recorded in whole years effective at the date the course began. Mean ages in the hybrid and traditional courses are in the vicinity of 20 years, reflecting the fact that most students take the course in their sophomore or junior year. The difference in mean *Age* between the courses is not significant according to the t-test.

Table 1 - Student Characteristics

Characteristic	Hybrid Course n = 117	Traditional Course n = 163	t-test (p-value)
Mean Age	19.94	20.18	-1.38 (.1694)
Mean Credit Hours	56.92	55.82	.39 (.6972)
Mean GPA	3.27	3.22	.85 (.3973)
Gender (% female)	43.59	42.94	.11 [@] (.9144)
Course Grade (%) Prior to Completing SET	71.24	72.58	-.80 (.4263)

Note: @ - The test for equality of gender proportions is a z-test rather than t-test.

Credit Hours earned by students prior to the beginning of the class are very similar in the two courses, with the means differing by just slightly more than one credit hour. The difference is not significant. *GPA* is measured effective at the date the course begins and the means are quite similar with the t-test indicating no significant difference. *Gender* splits in the two courses are also similar, both being in the vicinity of 43 percent female. The difference in the *Gender* percents is not significant according to the z-test. The last characteristic in Table 1 is the percent of available course points earned by students up to the date that the SET was administered. This information may be used by students to assess class standing and make projections of their final course grade. According to evidence presented by Isley and Singh (2005), class standing and grade projections have an impact upon SET scores. The difference in the percent of course points earned is not significant.

Overall, the lack of any significant differences in Table 1 is strong evidence that the students from both courses form a relatively homogeneous group. This is true at the beginning of the course and also toward the end of the course when a course performance record has emerged and may be being used by the student to project a final grade. There are no underlying student characteristics that are prevalent to greater or lesser degrees in one course versus the other. This homogeneity, coupled with the presence of the same instructor in both courses, creates the solid presence of a treatment group (hybrid course) and control group (traditional course) for assessing the impact of the hybrid format of instruction upon SET scores.

Results

Table 2 contains a common core of seven questions that were used in the SET instrument for both the hybrid and traditional courses. The questions are listed in the same order that they appeared in the instrument. The common core covers a broad set of categories but does not contain questions that are predicated upon an instructor presence in the classroom nor upon student attendance at class sessions. Recall that with the hybrid format students can opt to make the course mimic an online course (with the exception of exams) so in the common core we avoid any question involving reference to classroom decorum or instructor presence. The first six questions use a 5-point Likert scale (see note at the bottom of the table for scale categories). The last question is a request for an overall evaluation and also has a 5-point response scale but is based on a middle category of “Average” and deviations above and below it.

Table 2 - Student Evaluation of Teaching: Statements and Questions

Category	Statement or Question*
Understanding	This course increased my understanding of principles, concepts, generalizations, or theories.
Thinking	This course increased my ability to engage in critical, analytical, and independent thinking.
Level	The course was taught at an appropriate intellectual level.
Pace	The course was taught at an appropriate pace.
Grading	The instructor’s grading policies and practices were fair.
Materials	The learning materials used for this course facilitated my learning.
Overall	Which of the following comes closest to your overall evaluation of the instruction in this course? (1: Poor; 2: Below average; 3: Average; 4: Above average; 5: Excellent)

Note: * - The response scale for all statements is 1: Disagree strongly; 2: Disagree; 3: Neither agree nor disagree; 4: Agree; 5: Agree strongly. The scale for the *Overall* question is shown above.

We used three statistical tests to explore whether the SET scores from the hybrid and traditional courses are significantly different. The first test is the t-test for comparing means of SET scores from the two courses. This test was used earlier when assessing differences in student characteristics. The second test is the Wilcoxon rank sum (or Mann-Whitney) test. The null hypothesis is that the distributions of the two populations are identical. The test is nonparametric and is based upon ranks of the responses in the two courses. With our sample sizes, the large-sample version of the test is used and involves the z-score statistic. The third test is the Chi-square test for comparing the proportions of responses across the two courses and is based upon the multinomial nature of the Likert scale. The null hypothesis is that the proportions of responses across the five response categories in the hybrid course are the same as those in the traditional course.

Table 3 contains means of the SET scores along with the three test statistics for assessing differences between the hybrid and traditional courses. The consistency of the pattern in Table 3 is striking. In all seven categories, there is a significant difference between the hybrid and traditional courses with the means in the hybrid course being lower. Individual p-values for the test statistics are not reported since all are .000 when rounded, with the exception of the Chi-square statistic for the *Overall* category, it being .001.

Table 3 - Student Evaluation of Teaching Scores: Hybrid and Traditional Courses

Category	Hybrid Course Mean	Traditional Course Mean	t-test	Wilcoxon rank sum z-test	Chi-Square test of proportions
Understanding	3.79	4.52	-5.73	-5.74	33.61
Thinking	3.81	4.23	-4.09	-4.47	24.43
Level	4.06	4.64	-7.76	-7.52	57.28
Pace	3.90	4.53	-6.46	-6.73	47.22
Grading	4.10	4.55	-5.22	-5.48	30.55
Materials	3.96	4.41	-4.80	-5.08	27.23
Overall	3.98	4.39	-3.96	-3.87	16.88

Note: The p-values of all test statistics in the table are .000 with the exception of the Chi-square test for the *Overall* evaluation that is .001.

The mean score in the *Overall* category was .41 lower in the hybrid course. Similar amounts of decline were found in the mean scores for *Thinking* (.42), *Grading* (.45), and *Materials* (.45). The three largest declines in mean scores were in the categories of *Level* (.58), *Pace* (.63), and *Understanding* (.73). Lower scores for the hybrid course may be traceable, in part, to the inexperience of students with hybrid or online formats. Of the students in the hybrid course, 52.8 percent had not previously taken a hybrid or online class. Once the student was aware of the hybrid format at the course’s beginning, they had the freedom to drop from the section and then add back into a traditional section. Comparison of class rosters after the drop/add period with first-day class rosters indicated little activity of this sort. However, if a student does not substitute away from the hybrid course, it does not mean that they are ready to fully embrace the format. A student having no experience in an online or hybrid course may be so attuned to traditional courses that their first encounter with the hybrid format will have little chance of being highly regarded.

Experienced and inexperienced students alike in our sample may mark down SET scores in the hybrid course if they choose lower levels of instructor contact by eschewing the question-answer sessions. Bangert (2006) identified student-faculty interaction as one of the four fundamental factors of SET effectiveness. The hybrid course holds as many class meetings as the traditional course but they are question-answer sessions rather than traditional lectures. A student in the hybrid course may not feel the need to attend sessions if they are satisfied with their own progress and preparation level. Students are under no obligation to attend, although they are encouraged to do so. Dolnicar (2005) offers survey results concerning motivations of students to attend class. Three stand out: attendees want to find out what they are supposed to learn; attendees do not want to miss important information; attendees want to find out about assessment tasks. There is also strong evidence in economic education suggesting that class attendance has a positive and significant impact on student performance (Romer 1993, Dolton, Marcenaro and Navarro 2003, Chen and Lin 2008). Hybrid course students, particularly those having no experience with the format, may feel that the dimensions identified by Dolnicar are not present in the online lectures and/or question-answer sessions to the same degree as they are in face-to-face lectures and mark down SET scores accordingly.

While scores in all of the categories in Table 3 are driven to varying degrees by levels and quality of contact with the instructor, the *Materials* category provides a particularly good example. Mean scores in the *Materials* and *Overall* categories are very close, differing by only .02 in either of the course formats, a difference that is far less than those between *Overall* and any other category. The similarity is not surprising since it is in the *Materials* category where the fundamental difference between the hybrid and

traditional formats is found, the former using online lectures and the latter using face-to-face lectures. The text, topic coverage, suggested exercises, and computer homework guides were the same in both courses. Students in the hybrid course actually had more prepared materials, the extra being the online lectures. But the traditional course students had notes they had taken from their face-to-face lectures. As shown in Table 2, the evaluation question in the *Materials* category is not so much about volume of materials but whether the materials “facilitated my learning”. Even with fewer prepared materials and having to encode and store the live lecture information, the traditional course students are indicating that the materials facilitate their learning to a greater degree than do the hybrid students. During face-to-face lectures, the instructor frequently refers to course materials and emphasizes their importance, thereby promoting their value to the student with regularity. Similar promotion of learning materials also occurs in the question-answer sessions of the hybrid course. However, the only place that the traditional course students can hear a lecture is in the classroom so they may feel more compelled to attend class meetings than are the hybrid course students. Accordingly, they will have more contact with the instructor and will receive more promotional messages about the materials.

Are there particularly important dimensions of student-instructor contact, or lack thereof, that relate to SET scores? Cochran et al. (2003) explore instructor characteristics that are suspected of being primary determinants of SET scores in principles of economics classes. Their results show that instructor “enthusiasm” and “preparation” have the highest partial effects upon the *Overall* evaluation. Other research has found “charisma”, which may only be experienced in face-to-face lectures, to influence SET effectiveness (Shevlin et al. 2000). Spooen and Mortelmans (2006) also found “teacher professionalism”, which includes factors such as presentation skills, teacher support, and clarity of objectives, to positively influence student ratings of teaching. The manner in which preparation is demonstrated to students by the instructor differs substantially between the hybrid and traditional courses. In the latter, the degree and quality of instructor preparation is revealed to the student in the face-to-face lecture. In the hybrid course, instructor preparation is not revealed in person but rather through characteristics such as organization of materials, quality of online presentations, and ease of online navigation. Table 4 contains results for statements relating to preparation. The organization of online materials received a mean SET score of 4.31 in the hybrid course. In the traditional course, the statement relating to preparation is about class time being used effectively to promote learning. The mean SET score for the statement was 4.65. Students in the hybrid course are marking down the instructor in the preparation dimension versus the scores given by students in the traditional course. Assuming that the findings of Cochran et al. (2003) apply here, a markdown in the preparation score will provide a negative effect upon the score in the *Overall* category.

Student assessment of instructor enthusiasm is reported in Table 4 but is available only for the traditional course. The mean SET score for enthusiasm was 4.75. Loveland and Loveland (2003) reviewed selected articles related to SETs and developed a list of faculty characteristics/behaviors associated with enthusiasm ratings. Their list includes facial expressions, body language, verbal inflection/tone and use of humor as behavioral factors affecting student evaluations. Levels of enthusiasm shown by instructors are always on display in face-to-face lectures. In contrast, enthusiasm is an elusive characteristic in our hybrid format. Enthusiasm cannot be projected by the instructor to students in the hybrid course in the same manner as is done with face-to-face lectures in the traditional course. Students in the hybrid course may detect an element of enthusiasm in the audio narrations of the online lectures but they may not judge it to be on par with what they have experienced in face-to-face lectures in other courses. In effect, by operating in an environment where projection of enthusiasm is challenging, the hybrid course instructor will have a more difficult time of creating a positive contribution to their SET score in the *Overall* category.

The markdowns experienced in this study are generally less than markdowns that occur when moving from the traditional format all the way to a fully online format. For example, Farinella (2007) reported SET scores for two categories, overall rating for course and overall rating for instructor. The markdown was 1.11 for the course rating and .61 for the instructor rating. Those categories are combined in our *Overall* category that is phrased in terms of “the instruction” (see Table 2). Recall that the markdown was .41 for our *Overall* category score.

Due to the prospect of SET markdowns, decisions to participate in hybrid formats of course delivery can carry risks for instructors. Lower evaluation scores may well translate into lower performance evaluations. Accordingly, instructor pay and promotion decisions could be adversely affected. The extent of the effect is ultimately determined by the weight given to SET scores by administrators and/or supervisors in their performance evaluations. If performance is based in any way upon relative positions within an academic department or similar unit, then markdowns in SET scores could be costly. Take, for

Table 4 - Other Statements and Questions: Hybrid or Traditional Courses

Hybrid Course Only

How many online courses and/or hybrid courses have you previously taken?

Response*:	0	1	2	> 2
Percent:	52.78	18.52	14.18	13.89

Hybrid courses allow for more efficient use of my time than traditional classroom-based environments. (mean = 3.58)

Response*:	1	2	3	4	5
Percent:	10.19	7.41	19.44	39.81	23.15

The online presentation of course materials was well organized. (mean = 4.31)

Response*:	1	2	3	4	5
Percent:	0.00	1.85	6.48	50.00	41.67

Traditional Course Only

Class time was used effectively to promote learning. (mean = 4.65)

Response*:	1	2	3	4	5
Percent:	0.00	1.27	2.55	26.11	70.06

The instructor was enthusiastic about the subject matter. (mean = 4.75)

Response*:	1	2	3	4	5
Percent:	0.00	0.00	1.91	21.66	76.43

Note: * - The response scale is 1: Disagree strongly; 2: Disagree; 3: Neither agree nor disagree; 4: Agree; 5: Agree strongly.

example, the academic department of the instructor whose courses are being used in this study. For the most recent performance evaluation period, the *Overall* score in the traditional course (4.39) placed the instructor at the 70th percentile of the department faculty. The *Overall* score in the hybrid course (3.98) dropped the instructor to the 30th percentile.

Summary

The hybrid (or blended) course format is rapidly becoming a fixture in higher education. It comes in many varieties but online instructional elements and reduced in-class seat time are the common threads. Our hybrid course has a comprehensive online lecture component and also allows students to choose their amounts of in-class seat time. At one end of the spectrum, a student can choose zero in-class seat time and effectively create a fully online course for themselves. At the other extreme, a student can receive a double dose of instruction by dutifully working with online lecture materials and choosing to regularly attend class sessions.

We have demonstrated that SET scores are significantly marked down by students in the hybrid versus traditional format. When two sections of each format were conducted for an introductory economic and business statistics course, markdowns in mean scores occurred across all SET dimensions with the mean *Overall* score declining by .41 on the 5-point Likert scale. The decline represents a markdown of approximately 10 percent and for the instructor represents a substantial drop within the SET rankings of the instructor’s academic department. We believe that the study design is sound. The same instructor was used for all sections, thereby eliminating instructor-specific effects. The control and treatment groups used in the study had very similar characteristics (i.e. *GPA*, *Credit Hours*, *Gender* split, *Age*, same instructor, same

types of assessments) with the exception of the course format. Any prospective bias from self-selection by students into course formats was minimized by not advertising the hybrid format in course catalogs or advance registration materials.

While our results show strong negative effects upon SET scores from using the hybrid versus traditional format, we cannot conclude that the effect will always be negative in other situations. Much depends upon the specific characteristics of the hybrid course being offered and upon the instructor(s) that is participating. For example, SET scores in a hybrid course that has only minimal departures from the traditional version may not be marked down. Also, an instructor that is relatively weak along one or more SET dimensions in a traditional course might flourish in a hybrid environment and experience an increase in SET scores. Detection and description of differences in outcomes for hybrid versus traditional courses will likely continue as subjects in further research.

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