

## **One Course May Not Fit All: Online Accounting Course Offerings**

**Joshua C. Racca**  
**University of Alabama at Birmingham**

**Shani N. Robinson**  
**Sam Houston State University**

*Distance (i.e., online) education has become an increasingly popular form of higher-education instruction. A Pew Research Center survey conducted in 2011 revealed that a majority of colleges and universities now offer online courses; this trend was most pervasive among public universities (at 89 percent). Online (vs. in-class) instruction is considered more cost effective and has the potential to educate larger portions of the population. However, while some prior studies have focused on the efficacy of various educational delivery methods, some self-selection bias has generally been present in comparisons of online and traditional, in-classroom instruction. This paper provides preliminary evidence about the outcomes when students are not allowed to self-select between online and traditional instruction for an upper-level accounting course and instead are offered only an online course; our results suggest that when students are provided with this option, their exam performance and instructor-evaluation scores are higher. This suggests that upper-level accounting students self-select well between online and traditional instruction and that online education is not suitable for all students. This should be important to academic institutions and accounting researchers as we continue to explore issues pertaining to online education.*

### **INTRODUCTION**

According to a 2011 Pew Research Center survey, 50 percent of college presidents predict that by 2021, online classes will be a factor in the educations of most of their students (Taylor, Parker, Lenhart, & Patten, 2011). Further, the United States Department of Education (Means, Toyama, Murphy, Bakia, & Jones, 2009) has determined that approximately 65 percent of colleges and universities have adopted online education and now consider it a key component of their long-term strategies. Thus, online courses have become an increasingly popular method for delivering instruction, the trend is expected to continue, and associated student enrollments have dramatically increased, particularly within business disciplines. However, research on the *effectiveness* of online learning reveals concerns and mixed results (Bernard, Abrami, Lou, & Borokhovski, 2004; Bidwell, 2013; Watters & Robertson, 2009). Since universities are now facing a growing demand from students for such courses, they will no doubt face choices regarding the optimal mix of (online vs. traditional) classes in their curricula.

This research reports results that occurred when self-selection was not possible for an upper-level accounting course (due to a last-minute cancellation of an in-person instruction option). Further, we provide preliminary evidence about some of the potential outcomes of different university course-offering

structures, comparing online offerings<sup>1</sup> (in a semester when students could freely choose vs. a semester with no such option) to in-classroom instruction. Specifically, we investigate how giving students a choice between online and in-classroom instruction affects student performance and satisfaction. We find that when students are given the choice to self-select a course delivery mode (i.e., online or traditional), online students perform better (vs. when they are not given a choice) and perform on a par with students receiving in-classroom instruction. In addition, our results suggest that student satisfaction with an online course is much higher when this option is pursued voluntarily (vs. as a requirement, such as when no traditional course is offered) and is comparable to traditional in-classroom delivery.

This research contributes to the growing body of literature on distance education but maintains a focus on online education associated with accounting undergraduate courses. In addition, we explore one of the specific research questions posed by Bryant, Kahle, and Schafer (2005), the ideal mix of distance education and face-to-face time for accounting courses. The results of this research should be useful to academic institutions that are contemplating optimal delivery methods associated with the same course and to accounting researchers as we continue to explore the trend of online education.

## PRIOR LITERATURE AND HYPOTHESIS DEVELOPMENT

Prior research, associated with accounting and higher education, has explored outcomes of online and traditional courses and yielded mostly mixed results. Much of the research considers the efficacy (or equivalency) of online (vs. in-classroom) instruction. Equivalency theory suggests that if the content of a course is the same, then we generally would not expect to see drastic differences in student outcomes, regardless of whether a course is taken online or in a traditional classroom setting (Bryant et al., 2005; Simonson, 2002) and some support exists for this argument. When comparing the scores of undergraduate business students on an assignment, DiRienzo and Lilly (2014) find that the course delivery method (i.e., online vs. traditional) does not significantly affect student performance. Their experiment examined student performances associated with both a complex and basic assignment and found no significant differences between the scores of online and in-classroom students). Additionally, Gagne and Shepherd (2001) find similar results when comparing learning outcomes for a graduate-level introductory accounting course taught online and in the classroom. In their study, there were no significant differences in final course grades between students who enrolled in the traditional and online courses.

Still, several studies have noted differences in student outcomes and suggest that in various settings, online courses are not preferable to (or substitutes for) traditional, face-to-face instruction. Brown and Liedholm (2002) focused on principles of microeconomics courses and investigated whether students in virtual classrooms score significantly higher on exams than students in traditional classrooms and have found that exam performance is lower for online (vs. in-classroom) students. Coates, Humphreys, Kane, and Vachris (2004) make similar assertions, indicating that students in traditional (i.e., face-to-face) sections of an economics course scored higher on exams (vs. students taking the same course online). Other studies provide additional support, arguing that online courses are, in some ways, less effective (vs. traditional classroom settings) (Priluck, 2004). In a meta-analysis of online education literature, Bernard et al. (2004) found the average effect size of three measurements of student outcomes to be zero; however, there was wide variation, which suggests a great deal of variation in achievement. The degree to which students are able to appropriately self-select (for online vs. in-classroom instruction) may account for some of the mixed results in comparisons of education-delivery modes.

Thus, research on the effectiveness of online vs. traditional instruction has yielded mixed results; however, there is no doubt that other factors simultaneously influence student performance. Consideration of these variables is perhaps necessary when investigating differences between online and in-classroom students. Differences in student performance and satisfaction levels may be attributable to disparate factors (e.g., course level and student characteristics) vs. simply being a function of course-delivery method. Some prior literature does address this issue (e.g., noting that the *level* of course may affect student outcomes and is an important consideration for institutions seeking to determine an optimal mix of course offerings). Chen et al. (2013) found that while the course-delivery mode had no bearing on

student outcomes in accounting principles courses, it did create differences when a course was at an advanced accounting level. Specifically, in advanced accounting courses, traditional (vs. online) instruction methods yielded higher grades as well as ratings (of perceived course effectiveness).

Also, DiRienzo and Lilly (2014) suggest that in some of the studies, differences in outcomes (i.e., between online and traditional classes) are more of a function of the types of students who enroll in the courses (vs. course-delivery method). They contend that online student characteristics (e.g., age and work commitments) may lead to poorer performance vs. deficiencies in the online instruction environment. A U.S. Department of Education (USDOE) 2008 report has lent credence to this notion via the determination that online students tend to be older, married (or have dependents), and work more (vs. students in traditional classroom settings). Thus, it is likely that such characteristics contribute to whether a student initially decides to enroll in an online course. Coates et al. (2004) assert that self-selection is a key issue when examining the effectiveness of online education and can bias results when there is a failure to account for this. Our study uniquely contrasts results associated with online courses; we focus on a term when students have the opportunity to self-select against a term when they unexpectedly are offered only an online course.

Several accounting studies, with a focus on distance education, agree that students with certain learning styles are better suited for online-course instruction and not all students are equally equipped to succeed in online-course environments. Thus, while educators generally do not assign students to specific educational (i.e., online or traditional) environments (as students nearly always have the opportunity to self-select), we show that it may be unnecessary to do so. For subject areas such as accounting, which generally contain more quantitative course material, online instruction may not be optimal for all students. For example, Arbaugh and Rau (2007) found that online courses with greater levels of quantitative content were associated with lower levels of course satisfaction and student learning. Further, Vamosi et al. (2004) find that students in principles of accounting courses reported less overall satisfaction with online courses.<sup>2</sup> Thus, for institutions that offer an online and traditional classroom setting for the same course, self-selection may improve outcomes if students are able to select well; however, problems may arise if traditional universities attempt to substitute online instruction for face-to-face instruction and force all students to take a particular course online.

Given some of the potentially negative outcomes associated with online learning, we suggest that letting students select a method of instruction (i.e., online or in a classroom) may significantly affect their performance in (and satisfaction with) those courses. As significant differences in performance and satisfaction have been noted at the advanced accounting level, our study utilizes data from a senior-level accounting cost course to test the following assertions:

*Hypothesis 1: Student performance in online courses will be better when students have the option to take the course online or in a traditional classroom setting (vs. when no such option is given).*

*Hypothesis 2: Student satisfaction with a course will be higher when students have the option to take the course online or in a face-to-face setting (vs. when no such option is given).*

## METHODOLOGY

We collected archival data (i.e., exam results and student evaluations) associated with students who were enrolled in a required senior-level cost accounting course. This course is a requirement for accounting majors, is historically taken in the semester of graduation for nearly half of all accounting majors, was offered over three consecutive semesters, and was taught by the same faculty member.<sup>3</sup> However, due to resource limitations during one semester, only an online version of the course was offered, which was unique for a few reasons: 1) in the previous semester, both online and in-class options were offered; 2) over the previous five years, the course had always been offered in a traditional

classroom setting; and 3) the in-class course was originally listed in the schedule of classes and subsequently removed only a few weeks before the fall semester began. Interestingly, during the term when students were offered a choice to take the course online, 25 students elected to do so.<sup>4</sup> During the term when students were not offered an in-class option, 57 students were enrolled in the online course.<sup>5</sup>

No changes, until after the midterm exam, were made to the online course between the spring semester when students were offered a choice (i.e., between online and in-class versions of the course) and the fall semester when students were only offered an online version of the course. We collected summary information from student records to compare the performance and satisfaction levels of students who chose to take the course online when there was an in-class option versus those who took the course online when there was no in-class option. The following semester, the same exam was given, under the same conditions, to students taking the course in person. Those results are included for comparison purposes, and are very similar to the online course results during the semester when students could freely select to take the course online or in-class.

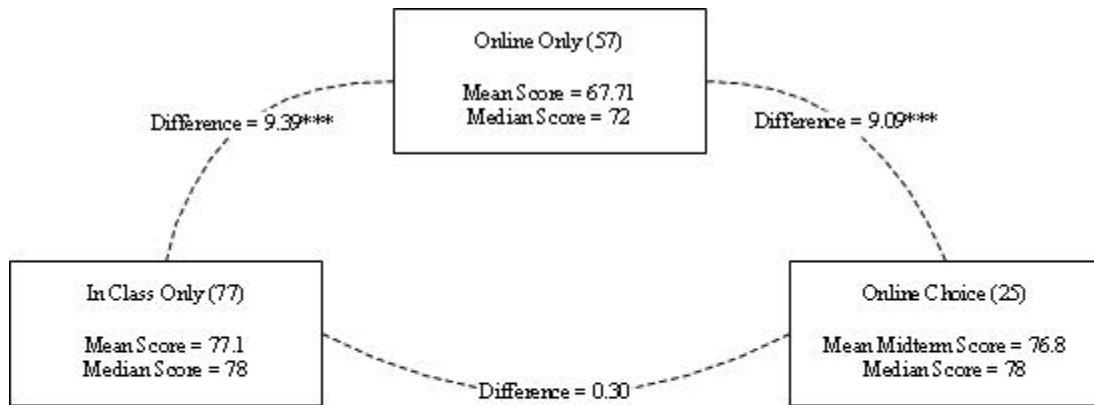
The midterm examination was selected to evaluate student-learning outcomes. This exam was proctored either in a computer lab on campus by the instructor (96%) or with an instructor approved proctor (4%); thus, the students' identities were verified and they were monitored. The midterm was chosen over the final because 1) the midterm occurred before the date to drop the course (so the drop rate would not affect results) and 2) a student's final exam could be affected by a poor showing on the midterm, confounding results.<sup>6</sup> The exams were all administered under similar conditions and had identical content. Both versions of the class (during the semester when they both were offered) retained availability so students could freely self-select either option. The end-of-course student evaluations (i.e., of the instruction) had been managed via an online system for all classes at the university for several years, thus the method of acquiring the evaluations should not have affected their outcomes.

## RESULTS

Our first hypothesis suggests that students perform better in online classes when they voluntarily select them (vs. when they are forced to take them). Figure 1 shows the midterm-exam results for students who chose to enroll in the online class during the semester when there was a choice (vs. those who enrolled when there was no in-class option and those who took the class in person).

The results in Figure 1 show a significantly higher midterm-exam score for students who had the choice to take the class online or in person and those who took the course in person in a subsequent semester (vs. students whose only option was the online offering). Additionally, the rate of failing grades (below 70) was 34 percent when students were offered no in-class course option (vs. 21 percent when they had a choice and 30 percent when an in-class section was offered). The rate of very poor grades (below 60) was also much higher (i.e., at 25 percent) when students were offered no in-class option (vs. 0 percent when they had a choice and chose the online course and 12 percent when they took the course in a classroom). This suggests that the better performing students are those most likely to choose to take the course online when the option is available. A much lower rate of very poor grades, overall, suggests that students with weaker performances generally did better with face-to-face instruction. This may account for many of the prior research results finding no difference in performance. It is possible that even for high performing students in online courses, their performance would be even higher with in-class instruction.

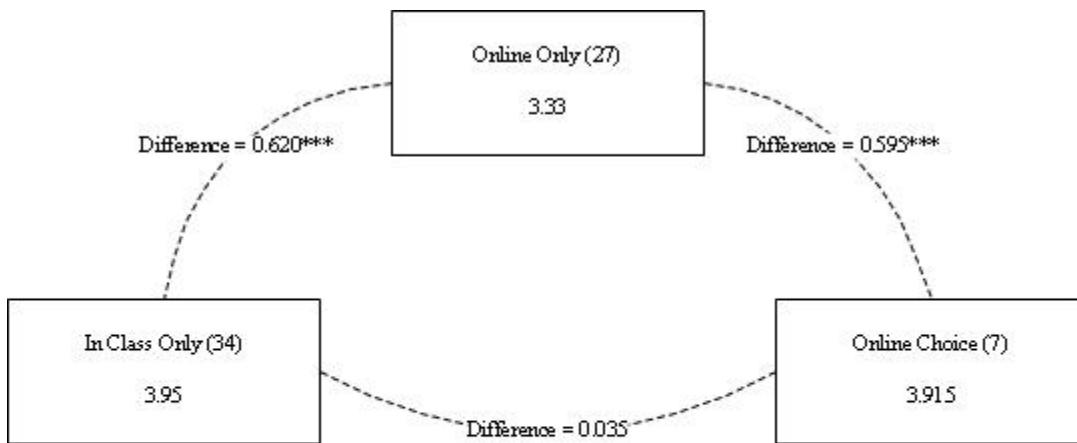
**FIGURE 1**  
**MIDTERM PERFORMANCE COMPARISON**



\*, \*\*, \*\*\* indicate significance of one tailed t-test at 10%, 5%, and 1% respectively

Our second hypothesis is that student satisfaction with online courses is higher when they have the choice to take the course in a classroom or online (vs. online only). Figure 2 shows the student-evaluation scores for both groups and scores for students who only took the class in person. The student-evaluation scores are significantly lower when the course was only offered online (vs. for the other two groups).

**FIGURE 2**  
**STUDENT EVALUATION COMPARISON**



\*, \*\*, \*\*\* indicate significance of one tailed t-test at 10%, 5%, and 1% respectively

0 indicate number of evaluation completed with each evaluation consisting of 18 items that create the evaluation score

An additional item on the student evaluations asks the students to self-report their (perceived) effort in comparison with other students. Students who chose to take the class online, when there was also an in-class option, rated themselves 4.4 out of 5.0 (vs. 3.9 for students taking the course online with no in-class option and 4.2 for students taking the course in a classroom with no online offering). This further supports the contention that better performing students are most likely to choose online instruction. Thus, there are benefits to allowing students to freely choose between online and in-class offerings.

## SUMMARY AND LIMITATIONS

We examined two key outcomes associated with a university, advanced-level accounting course with an in-class and online option: student performance and student satisfaction with the course. For both student outcomes, we found the results to be more favorable when students had the option to choose (i.e., to take the course online or in person) than when there was no in-class option. While we agree with prior research that self-selection bias may sometimes pose a problem for education *research*, we find a positive outcome associated with self-selection in the case of upper-level accounting students who (in this case) are choosing appropriate offerings for their skillsets, making self-selection a positive for education *outcomes*.

Still, it is clear that differences have been found between the online student prototype and the more “traditional” student; however, we believe that these differences are to be expected and that universities must ensure that their chosen mix of course offerings can accommodate these differences. More specifically, given that all students may not adapt well to online courses (and similar delivery methods), it is up to academic institutions to simply provide options to accommodate differences in learning styles. Thus, even with the growing popularity of online courses at the university level, it is important that traditional institutions do not allow the online phenomenon to negatively affect their course mixes.

While our results provide preliminary insight into online accounting education, some limitations do exist. Data were collected from a sample of students at one university and for one advanced-level accounting course. Thus, the results may not be generalizable to other populations or even hold for other accounting courses (e.g., in lower-level courses, students may not know themselves as well, may not self-select as effectively, or may have a lower level of comfort with the material, which has been shown to negatively affect online-education effectiveness) (Chiu, Gershberg, Sannella, & Vasarhelyi, 2015). Also, we have no data associated with students who chose to take the course; thus, the only known difference is when they could freely choose between the two types of instruction and when they could not.

Therefore, the generalizability of results beyond upper-level accounting students at one university is uncertain. However, this situation has provided a unique context for examining the issue of self-selection and it appears, based on the findings, that limiting self-selection is not always beneficial. Future research, in this area, should examine other effects associated with such choices by universities (i.e., to offer a mix of online and traditional courses or limit such choices). Other relevant factors that warrant further inquiry include faculty-satisfaction levels (associated with teaching the same course via different delivery modes) and course-equivalency issues when the same course is taught via different delivery modes.

## ENDNOTES

1. This includes one semester when students could freely choose between online and in-classroom instruction as well as a semester when an online offering was the only option, as well as a third semester in which the course was offered only in class. The in class only semester was schedule this way well in advance, and students who would choose online knew it would not be offered online.
2. For the accounting department used in this study, online courses average approximately 0.2 lower out of 5.0 on student evaluations (vs. face-to-face courses).
3. No experimental treatment was involved and no surveys were distributed beyond the normal university requirements for student evaluations.
4. Thirty-two students took the in-person section in this semester.

5. During the time period involved, 50-70 students were typically enrolled in the course each semester, totaled across all section offerings.
6. The final exam results were not significantly different; however, the drop rate for the classes was different so the population taking the midterm in each class was different than the population taking the final ... Additionally, extra study resources (e.g., in-person study sessions and tutors) were made available to students taking the course online when it became clear that without additional help, there would be a large number of students who would not be graduating as expected.

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