

A COMPARISON OF STUDENTS' PERFORMANCE IN AN ONLINE MANAGERIAL ACCOUNTING COURSE WITH IN-CLASSROOM SETTING

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ABSTRACT

This empirical research study is comparing students' performances in an online versus in-classroom setting in an introductory managerial accounting course. The research question is whether there is a significant difference in the learning outcomes. The research methodology used in this study includes scores from 12 weekly online assignments, a final examination held on campus, and total marks. The data collected represents three classes taught in the fall semester of 2011 (two in classrooms and one online). This study confirmed the findings of previous studies that students having only online instruction were as successful as students having classroom instruction. It concluded that course instruction and pedagogy are more important for student learning than the type of media delivery and instructors of online learning environment should focus their effort on quality in designing and developing online courses.

INTRODUCTION

Higher education institutes around the globe have long experimented with different learning environments to accommodate the needs of their students. Along with the classroom face to face classroom, we have seen the use of distance education (e.g., correspondence courses, televised courses, and, lately, online courses). Online learning has become a leading growth sector in higher education. According to the 2011 Sloan Survey of Online Learning (Sloan Consortium 2011), the rate of growth of online enrolments has continued to be far in excess of the rate for the total higher education student population (Allen & Seaman, 2011). Over 6.1 million students were taking at least one online course during the fall 2010 term; an increase of 560,000 students over the number reported the previous year. The ten percent growth rate for online enrolments far exceeds the less than one percent growth of the overall higher education student population. Thirty-one percent of all higher education students now take at least one course online.

Online learning advocates have stated that online learning provides more flexible access to content and instruction and is more cost-efficient by enabling instructors to handle more students while maintaining learning quality that is equivalent or comparable to face-to-face instruction. Other researchers suggest that online education has created a shift in the way higher education institutions offer their programs (Bassoppo-Moyo, 2006). However, educators continue to question the quality of student performance and learning in an online environment compared to face-to-face environments or classroom (also referred to as *blended*) environments, containing a

mixture of face-to-face and online learning (Parsons-Pollard, Diehl, & Hylton, 2008). A review of over 200 studies comparing the differences among distance education (including online) and face-to-face classes revealed mixed results, suggesting that further studies are needed to determine the effectiveness of online instruction (Bernard, et. al., 2004). Authors of the review concluded that “methodology and pedagogy are more important than media in predicting achievement” (p.399), and they encouraged instructors of online classes to focus their efforts on quality course design rather than the environment in which it is presented. This argument is consistent with the findings of some studies, which have found no significant differences between online and face-to-face student achievement (Fortune, Shifflett, & Sibley, 2006; Herman & Banister, 2007; Koory, 2003; Tallent-Runnels, et. al., 2006; Warren, & Holloman 2005; Weber, & Lennon, 2007).

A recent meta-analysis (Means, Toyama, Murphy, Bakia, & Jones, 2009) concluded that the success of online learning approaches appears quite broad across different content and learner types. However, most prior studies were conducted in non-technical settings, and the results might not apply to technical courses such as accounting (Bryant, Kahle, & Schafer, 2005; Arbaugh, 2005). Another problem with prior research is that the vast majority of studies used students’ final grades to measure the effectiveness of student learning. Other measures are needed to add insight into the ways in which student performance might vary across instructional methods (Kan & Cheung 2007; Arbaugh, et. al., 2009).

This study first provides a literature review of the performance of online students in accounting courses. Next, students’ performance in an introductory managerial accounting course is compared between an online and a classroom setting using two different learning measures. Finally, conclusions are drawn.

PRIOR RESEARCH IN ACCOUNTING

Online learning research studies in accounting as a technical field are a relatively few and have addressed topics such as instructors’ descriptions of their experiences with online courses, comparison of student performance in different learning environments and students’ satisfaction with online learning. Comparison of student performance in different learning environments studies yield mixed results. Some studies have concluded that online learning is as effective as classroom or classroom learning. For example, Gagne and Shepherd (2001) found that an online environment was as effective as a classroom in terms of student learning and that students’ course evaluations were similar, although online students were less satisfied with instructor availability than face-to-face students. Basile and D’Aquila (2002) found no significant differences in a study of 128 students in four sections of a Principles of Financial Accounting course taught by two different instructors after controlling for differences based on the course instructor. Chen and Jones (2007) compared an online MBA course and a classroom MBA course and reported insignificant differences for final grades and overall evaluations of the course and instructors, but reported some student preferences for group work in the classroom

course. Keller, Hassell, Webber, and Johnson (2009) reported no significant difference in final grade between students in an online and a classroom introductory managerial accounting course.

Some research studies have concluded that students in online environments tend to outperform their counterparts in face-to-face settings. Campbell, Floyd, and Sheridan (2002) reported that students in online principles of accounting course performed significantly better on a comprehensive multiple-choice exam than those in a classroom course and were more satisfied with the course and the instruction. Abraham (2007) examined the participation and performance of graduate engineering students enrolled in two sections of a financial management course in two different semesters, with one section using an online approach and the other section using a classroom approach. Students in the classroom environment displayed increased participation in non-compulsory assignments and achieved higher marks in both in-session and final examinations. Stivason, Saunders, and Price (2008) found that students in an online introductory accounting course performed better on assessments than students in a classroom. Jones and Chen (2008) reported that MBA accounting students in online learning sections had more positive group work experiences and more positive perceptions of instructor feedback compared to students in a face-to-face section.

In contrast, other studies have concluded that students in online tend to under-perform their face-to-face counterparts. Vamosi, Pierce and Slotkin (2004) reported that online students' satisfaction and perceptions about effectiveness in the delivery of course materials were lower than that of students in a classroom when class content rotated between live lectures and live lectures captured for viewing over the Internet during the second half of the course in a financial accounting course. Similarly, Chen, Jones, and Moreland (2010) found that online students received lower mean scores than face-to-face students in three of four areas studied in an intermediate-level cost accounting course.

Most of these aforementioned studies used students' final grades when comparing the effectiveness of the online method to online or classroom face-to-face delivery. In addition, these research studies frequently failed to control for differences in teaching and grading formats where two or more instructors delivered the course content or by the same instructor but over more than one semester. Thus, it is recommended that researchers should use well-designed strategies to provide better evidence about student learning in online versus face-to-face classroom environments (Means et. al., 2009; Reeves, 2005; Tallent-Runnels et. al., 2006). Thus, the main purpose of this study is to contribute to the current stream of online learning literature by: (1) examining the student performance using three different measures of learning; and (2) controlling for instruction and grading formats by having the same instructor teach both online and classroom sections in the same semester using the same measurements of learning outcome between the two types of delivery. As a result, differences in factors such as institutional environments, grading standards, and instructor teaching style are minimized.

RESEARCH METHOD

Research Design

A quasi-experimental research design was applied to students registered in three sections in fall 211 of an introductory managerial accounting course taught by the same instructor. Students self-selected into each section are used in this study. It assumes that students would enrol in a section offering the teaching mode that would best maximize their utilities such as grades, more cost-efficient, and more flexible access to content and instruction. This self selection would not affect the robustness of the study because students were all from the same school and taking a core course which is required for all undergraduate business major students. This allowed for the student's profile to be comparable in both teaching modes. Self selection was used by the vast majority of prior studies. Moreover, to have a high degree of internal validity and achieve as close a comparison as possible between classroom and online sections, the same instructor taught all three sections, eliminating differences across sections in confounding factors such as institutional milieu, grading standards, and instructor teaching style. Furthermore, efforts were made to ensure that students in the two learning environments participated in the same learning activities, assignments, and discussions in addition to having access to the same textbook and other learning aids such as assignment solutions, PowerPoint slides, and previous examinations and related solutions. One issue often raised in the debate over the two learning environments is the interaction and discussion that can occur in a face-to-face classroom. In an effort to facilitate similar interaction and discussion, students in the online treatment may use a discussion board to post comments or ask questions to other students or teaching assistants. Traditional office hours were offered for students in the classroom, while virtual office hours were held for the online students.

Measures of Student Learning

Students' performance was compared with three different measures of learning, consisting of twelve weekly online assignments, a final examination (held on campus) and total marks. Students in both groups (classroom and online) were required to register at WileyPlus Course Management Systems to perform the twelve weekly online assignments.

The twelve weekly assignments corresponded to the twelve chapters required for the course and consisted of true/false statements, multiple choice questions, and problem solving questions requiring calculations, analyses, or short answers. Each assignment was graded as a pass or fail with two attempts for each question. To earn a pass grade, students needed to receive a minimum of 60% of the 100 marks available for each assignment. To receive the full 10% grade allocated to the online assignments, students needed to pass twelve out of twelve assignments. After the due date for each assignment, students were able to review the assignment, answers, solutions, and link to the online textbook. These weekly assignments were essential to keep students active

while providing learners with timely and meaningful feedback and assessment in the online or classroom environment. This created an element of motivation and an educational design that promotes a more active, collaborative, and participatory learners as those commonly found in the face-to-face environments. A common final examination was administered on campus to all students in both learning environments at the same time. Student performances in twelve online assignments, the final examinations, and total marks were used to perform the comparison between the two different learning environments for fall 2011.

Statement of Hypotheses

The null hypotheses for this study are:

1. H_0 : There is no statistically significant difference in students' performance between the classroom section and the online section in the 12 weekly assignments.
2. H_0 : There is no statistically significant difference in students' performance between the classroom section and the online section in the final examination.
3. H_0 : There is no statistically significant difference in students' performance between the classroom section and the online section in the total marks.

Data Collection Procedures

There were 184 students enrolled in the two traditional classroom sections and 134 registered for the online section. The results presented below only include data from students who completed all requirements for the course. In the traditional classroom sections, 19 students withdrew from the course and 9 students did not write the final examination for personal reasons leaving 184 students in the two sections that completed the course and received final grade. In the online section, 6 students withdrew from the course and 11 students did not write the final examination, leaving 134 who completed the course and received final grades.

Statistical Analysis and Results

First, we analyzed and compared the results for the two classroom sections with regard to students' performance in the 12 weekly online assignments and the final examination using a t-test to determine if the two classroom sections could be treated as a single sample for comparison with the online section. The results of students' performances in the two assessments noted above were not significantly different between the two classroom sections. Therefore, the two classroom sections were treated as one section of 184 students for hypothesis testing over fall 2011. Summary performance measures for students in both the classroom and online sections and related tests in fall 2011 are presented in table 1.

TABLE 1: SUMMARY STATISTICS AND TESTS OF STUDENTS' PERFORMANCES

Section	Number of Students	Mean Score	Standard Deviation	Standard Error of the Mean	F-Value	Significance Level
PANEL A: Students' Performances in 12 Weekly Assignments						
Classroom	184	8.65	2.17	0.160	0.005	0.943
Online	134	8.52	1.98	0.169		
PANEL B: Students' Performances in the Final Examination						
Classroom	184	57.72	17.14	1.26	0.787	0.376
Online	134	48.28	16.44	1.89		
PANEL C: Students' Performances in the Total Marks						
Classroom	185	67.34	17.22	1.27	1.319	0.252
Online	134	57.71	15.81	1.37		

The average scores on 12 weekly assignments reported in Table 1- PANEL A are the number of points awarded out of 10, The results of t-test analysis that was performed to test whether the students' performance on these assignments are significant different between the in classroom and online sections. The results indicated that the average score on weekly assignments in the classroom sections (8.65) was not significantly different from the average score achieved by students in the online section (8.52) at F-Value 0.005 which measured the difference between classroom and online variances at the 0.943 significance level.

Table 1- PANEL B, demonstrates the results of t-test analysis that was performed to test whether the students' performance on final exam mean scores differ between the in classroom and online students. The results indicate that the average of final exam in classroom students was not significantly different from the average of final exam of online students at the 0.376 level of alpha. However, in classroom students section have higher average final exam mark than online section. They averaged 57.72% while the online students averaged 48.28%. We accept the second null hypothesis that there is no statistically significant difference in students' performance between in classroom students and online students in final exam.

Table 1- PANEL C, above were the results of t-test analysis to address whether or not the students' performance in total mark mean scores differ between the face to face classroom and online students. The results indicated that the average score of total mark for face to face classroom students was not significantly different from the average total mark mean score of online students at F-Value 1.319 and the 0.252 level of alpha. Nevertheless, face to face classroom students section performed higher than online section in this analysis. They averaged 67.34% whereas the online students averaged 57.71%. Therefore, we accept the third null hypothesis that there is no statistically significant difference in students' performance between

face to face classroom students and online students in total mark mean scores in fall 2011, winter 2012, and summer 2012 term.

CONCLUSION

In just over a decade, online learning has become an innovative form of teaching in higher education worldwide. With innovation comes challenges, and educators face just that, as they strive to fully understand how to use this great learning technique. A primary focus for all educators involved in online instruction is the learning outcomes. The major focus of this study was to compare the learning outcomes of students' performance between those in an online learning setting and those in a classroom setting. This was achieved using two different learning outcomes to better assess and demonstrate the effectiveness of the two types of media delivery in an introductory managerial accounting course. Students were required to complete twelve weekly online assignments and a final examination held on campus. The results of this study revealed that students registered in the online section were as successful as students enrolled in the classroom section. Students were able to learn the course material in both types of settings. The results from this study support the findings of prior research in that students' performances in online courses are comparable to those of students in classroom or traditional classes. One may well also conclude that the teaching style and the pedagogy are far more imperative for student learning than the type of media delivery. Furthermore, instructors of online classes should dedicate their efforts to designing and developing a quality course outline which encompasses learner-centered environment, knowledge-centered environment, assessment-centered environment and community-centered environment to both motivate and keep learners constantly involved.

LIMITATIONS OF THE STUDY

Despite the fact that the study has provided us with further insight into the realm of online learning, some limitations were observed. These limitations include the fact that the study was conducted at a single university and for a single course, managerial accounting, which was taught by one instructor. Furthermore, the assignment of students to each group was not random as the students had the choice of enrolling in any group, assuming students would enrol in the teaching mode that would best maximize their utilities in terms of grades, more cost-efficient, and more flexible access to content and instruction. Even though the study's results were informative, this study does not promote one medium of delivery (classroom or online) over another, nor does it attempt to measure the effect of teacher/student and student/student interaction on learning outcomes.

This study concentrated on the form of delivery as the main factor influencing students' performance in the course. Nevertheless, other factors could have influenced the results such as:

previous online course experience, proficiency with a particular classroom webpage (WileyPlus), work experience and other student demographics.

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INTERNATIONAL JOURNAL OF INTERDISCIPLINARY RESEARCH

VOLUME 2, NUMBER 2, December 2013

ISSN 2165-3240



A PUBLICATION OF FROSTBURG STATE UNIVERSITY AND THE
INTERNATIONAL ACADEMY OF BUSINESS DISCIPLINES

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