

Assessment Of Student Performance And Attitudes For Courses Taught Online Versus Onsite

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Abstract

This paper assesses the differences in performance and attitudes of students taught online versus onsite. Students completed a course evaluation designed to determine student satisfaction in specific areas. Student performance was measured by means of a comprehensive exam that tested all material covered in the course. Results support the contention that students in online courses learn as much or more than students in traditional onsite courses and are as satisfied with the course and the instruction as their onsite counterparts.

Introduction

Distance education is not a new phenomenon, and has been practiced in one form or another since the early 1900s (Moore and Kearsley, 1996). The interest in and development of distance learning is predicted to continue to grow in the 21st century as various social and economic trends drive its development. Department of Education statistics suggest that college enrollments will hit approximately 20 million by 2010 due to the predicted growth of high school graduating classes (more than 20 percent between 1996-2005), the greater proportion of high school graduates that are enrolling in college (67 percent) and the increase in nontraditional college students, a phenomenon fueled by changes in employment and wage structures of the American economy. State governments have begun investing in distance learning programs instead of enlarging traditional campuses because of budgetary constraints and the need to provide service to large, sparsely populated geographic areas. Cultural and lifestyle changes are also playing an increasing role in the development of distance learning as flexibility and convenience replace the students' needs for connectivity (AAUP, 1997).

While there is a long and well-established history of studying the efficacy of teaching and learning at a distance, the research outcomes are varied. By 1977, however, there was agreement among researchers that whether a student learns more from one medium than from another is at least as likely to depend on how the medium is used as on what medium is used (Schramm). Several studies that compare cognitive factors such as, academic performance, achievement, examination results and grades in distance learning in general found no differences in cognitive factors. (Nunley, 1965; Kuramoto, 1984; Weingand, 1984; McCleary and Egan, 1989; Pirrong and Lathen, 1990; Souder, 1993; Naber; LeBlanc 1994; Spooner, et. al. 1999; and Carswell, et. al. 2000).

Research on other factors such as student satisfaction with the course has yielded more mixed results. Davis (1984), Ritchie and Newby (1989), and Pirrong and Lathen (1990) found that distance-learning students were less satisfied with their distance learning classes than students in traditional classrooms. On the other hand, Jones (1992), Stahmer, et.al. (1992), Goodwin, et.al. (1993), and Naber and LeBlanc (1994) found students' _____

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attitudes favorable to distance learning. The findings of some studies such as Kuramoto (1984) were mixed and inconclusive. Other research indicated that faculty and students showed more favorable attitudes towards teaching and learning through distance learning once they had experience in teaching a course or taking a course in a distance learning format (Carswell, et.al, 2000; and Sonner, 1999).

The online distance-learning program at the authors’ university began in 1998 with five courses and 16 students, and has grown to over 100 courses and 1850 students. In spring 2001, three online degree programs, at least one course in every category of the general education core and most business common body of knowledge (CBK) courses were offered online.

In an effort to insure that student learning and student satisfaction in the online courses were commensurate with traditional onsite instruction, or at least at an acceptable level, the accounting faculty developed an assessment program to study the performance and attitudes of online students compared to traditional onsite students.

Principles of Accounting I was the initial accounting course that was developed and offered online in fall 2000 using the eCollege Internet distance-learning platform. This platform allows standard Internet distance learning features such as chats, threaded discussions, online quizzes and exams and access to text, PowerPoint presentations, homework solutions, and other resource material. This paper assesses the differences in student performance and attitudes between the online course offered via the Internet versus a traditional onsite course.

Six course sections were involved. Five sections were taught onsite by two different instructors. One section, taught by a different instructor, was taught in an online format. All instructors were experienced in teaching the Principles of Accounting I course. Due to dissatisfaction with the previously used text, a new text was selected and used for the first time during this fall term. The text, Financial Accounting, seventh edition by Needles and Powers was a new edition in fall 2000, which did cause some difficulty, as some materials were not available as soon as expected.

To achieve some consistency the instructors adopted a common syllabus, covered the same chapters and gave the same homework assignments. However, homework collection and credit policies varied. Each instructor prepared his or her own exams, except for the comprehensive portion of the final exam. Chapter quizzes were given as teaching aids and to allow students to assess their progress, but were not considered in determining grades.

Onsite instruction included traditional lecture/discussion as well as in-class group activities and homework review. Online instructional material was available from the publisher. It included a comprehensive summary for each learning objective in each chapter and a PowerPoint slide presentation, which covered the same material but in a different way. Use of these materials by online students was optional. No data was collected on the amount of time students spent on these materials.

Online instruction also included seven one-hour full-class “chats” during which the students and the instructor were all online in a chat group and could communicate by typing comments that everyone could see. During chats, students were encouraged to ask questions, which they often did, and the instructor also posed questions for discussion. About half the class usually participated in the chats. Students who did not join the chats supposedly had unavoidable conflicts. Attempts to create small chat groups of 4 to 5 students were not successful, although a few students did develop informal relationships and emailed each other to discuss problems. Threaded discussions were not used. Students also were encouraged to email the instructor or to call by telephone, or arrange a time for the instructor to call them. Email questions from students averaged about 10 per week. The telephone option was used only a few times.

Demographic information for students who completed the Course and Instructor Evaluation is presented in Table 1.

Table 1
Students Who Completed the Course and Instructor Evaluation

Section	<u>By Gender</u>			<u>By Class Level</u>				
	Male	Female	Total	Fr	Soph	Jr	Sr	Other

1	10	14	24	7	10	6	1	0
2	9	15	24	14	5	2	0	3
3	5	7	12	1	8	1	0	2
4	7	7	14	3	4	2	2	3
5	7	6	13	3	4	6	0	0
Total Onsite	38	49	87	28	31	17	3	8
6*	3	11	14	6	2	4	0	2
Total	41	60	101	34	33	21	3	10
*Online								

The overall ratio of males to females is representative of the population at the University. The difference in male-female ratios in online vs. onsite courses was not significant at the .05 level. The class levels of the students are typical for Principles of Accounting I courses, and once again the difference for online and onsite was not significant at the .05 level. The indicated class sizes are small, because all students did not complete the evaluation and because, traditionally, about 30% of students who start the Principles of Accounting I course, drop out before the final exam.

The number of students who took the final exam was 134: 120 onsite, and 14 online. Thus, 33 students who took the final exam did not complete the Course and Instructor Evaluation.

Assessment

Two instruments were used in this study: one to assess student attitudes and one to assess student performance. Student attitudes will be discussed first.

Since the online program at our University has its own student attitude assessment form, this form was used without modification to assess student attitudes in the online course. The assessment was done in the normal way via the Internet by the online administrative staff. However, because some questions pertain only to online issues, these questions were deleted in developing the instrument for onsite use. Since the objective was to make comparisons between the two types of instruction, results of the online-specific questions were ignored for this study, and only the responses to questions used in both online and onsite classes are included in this assessment. Table 2 is shown below in landscape format and contains an analysis of student responses to the Course and Instructor Evaluation. The response scales differed by question. A legend explaining the responses is provided at the bottom of Table 2. Generally the first response (e.g., Very Good) indicates greater satisfaction. The numerical scale goes from 1 to 5, with 1 generally indicating greatest satisfaction and 5 indicating greatest dissatisfaction.

Only the response to question number 3 had a significant difference at the .05 level. Students in the online course felt the instructor was more available/approachable for dealing with course questions, problems and issues. Question 18 had a response difference that was significant at the .06 level. Students in the onsite course felt they had better interaction with their fellow students. None of the response differences on the remaining 17 questions were significant even at the .10 level. On these questions online students were more satisfied in 10 areas, while onsite students were more satisfied in 7 areas. Overall, students seem to have been neither more nor less satisfied with online instruction versus onsite instruction.

Table 2
Analysis of Responses to Student Course and Instructor Evaluation

<i>Response Means</i>					
Q #	Onsite	Online	Sig.	Scale	Question
3	2.42	1.79	0.016	VG-VP	Instructor was available/approachable for dealing with questions, problems, etc.
4	1.81	1.64	0.523	VG-VP	Knowledgeable/competent for instruction in the course area

5	2.73	2.29	0.213	VG-VP	Caring/concerned about my progress/performance in the course
6	2.08	1.93	0.588	VG-VP	Enthusiastic/genuinely interested in teaching the course
7	2.74	2.79	0.871	OB-FBA	Compared with all other college instructors I have had, this instructor was
8	1.87	2.15	0.201	SA-SD	The course goals were clearly identified/explained
9	1.93	2.54	0.134	SA-SD	The course appears to have been carefully planned/facilitated
10	2.43	2.77	0.342	SA-SD	The course lessons/materials were clear and easy to follow
11	2.58	2.38	0.608	SA-SD	The course was facilitated in a way that made me feel free to ask questions, express my ideas, disagree
12	1.89	1.85	0.892	SA-SD	The course material was challenging/ demanding/intellectually stimulating
13	1.74	2.08	0.150	SA-SD	The course assignments were useful in learning the material
14	2.33	2.08	0.476	SA-SD	The course schedule was demanding but adequately flexible
15	2.26	2.46	0.348	FTF-FTS	The pace of this course was
16	2.51	2.31	0.315	TH-TL	The "work load" level of class assignments/projects was The course assignments were fair and appropriate methods for evaluating my performance in the class
17	2.28	2.46	0.621	SA-SD	
18	2.20	3.00	0.056	VG-VP	The interaction that I had with other students in this course was
19	2.69	2.38	0.360	VG-VP	The interaction that I had with the course instructor was
20	2.75	2.54	0.578	VG-VP	The amount/quality of feedback I received from the course instructor was
21	2.11	2.08	0.918	VG-VP	Rate the course materials/resources (text, readings, web site, etc.) in terms of their overall quality for enhancing your learning experience

Scale Legend

- VG-VP Very Good (1) - Very Poor (5)
- OB-FBA One of the Best (1) - Far Below Average (5)
- SA-SD Strongly Agree (1) - Strongly Disagree (5)
- FTF-FTS Far Too Fast (1) - Far Too Slow (5)
- TH-TL Too High (1) - Too Low (5)

The second purpose of the study was to assess student performance, that is, the degree to which students learned the course material. A comprehensive final exam was developed for this purpose. It consisted of 40 multiple choice questions from the authors’ test bank. Questions were chosen for each of the 12 chapters covered in the course and were selected to address the main points of each chapter. Although some questions were computational, there were fewer computational and more conceptual questions than would be typical on a mid-course exam covering only 3 or 4 chapters. All three instructors reviewed the proposed exam, and changes were made based on suggestions from each instructor. The results on the comprehensive final exam are presented in Table 3.

Table 3
Analysis of Scores on Comprehensive Final

Part I *Comparison of Average Number of Correct Responses Out of 40 Questions*
(Difference is Significant at the .000 Level)

	<u>No. of Students</u>	<u>Average Number of Correct Responses</u>	<u>% Correct</u>
Onsite	120	24.4	64.0
Online	14	31.3	78.3
Total	134		

Part II *Questions with a Difference in Average Number of Correct Responses of 20% points or More for Onsite vs. Online Students*

		% Correct			
Ch #	Q #	Onsite	Online	Significance Level	Topic Area of Question
1	3	66	86	0.23	Main purpose of financial statements
2	5	55	79	0.16	Impact on retained earnings
4	11	65	93	0.07	Accounting cycle
5*	13	47	100	0.0005	Objectives of financial reporting Characteristics of accounting information
5	14	57	93	0.02	Calculate working capital
5	16	53	86	0.04	Definition of gross margin
6	17	70	100	0.04	Definition of internal control
6	20	15	36	0.12	Valuation of trading securities
7	22	38	93	0.0002	Reason for allowance for uncollectible accounts
7	23	55	79	0.16	Calculate ending inventory: periodic, average cost
8	26	56	79	0.17	When to recognize a liability
9	28	78	100	0.10	Matching principle and warranty expense
9	31	46	100	0.0004	Items to include in the cost of a machine
10	33	69	93	0.12	Advantages of issuing long-term debt
11	35	44	79	0.03	Net effects of a cash dividend
12	40	48	79	0.06	

* Chapter 5 is Financial Reporting and Analysis. It includes objectives, characteristics and conventions related to financial statements, classified balance sheet and income statement, and analysis of financial statements.

Table 3 compares the test results in two ways. Part I is a comparison of the average number of correct responses on the 40-question exam and the average score in percent. Onsite students answered an average of 24.4 questions correctly (64.0%), while online students answered an average of 31.3 questions correctly (78.3%). This difference is significant at the .000 level and is the most statistically significant finding in this study. Reasons for this difference could include differences in student motivation and ability. Online students may have spent more time studying the material and may have completed a greater portion of the homework. Perhaps the online materials and activities have greater educational value than the traditional materials and classroom activities used in the onsite classes. These possibilities are not addressed in this study. The reasons for the better performance of the online students are unknown.

Part II of Table 3 presents individual questions from the exam on which there was a difference in average number of correct responses of 20 percentage points or more for onsite versus online students. Differences that are significant at the .05 level are shown in bold in the Significance Level column in the table. The online students performed better than the onsite students on all of the questions included in the table. For questions not included in the table, online students performed better on most, but not all, of the questions. A review of the questions showing significant differences did not yield any consistency in type of question or topic area, except for questions relating to financial reporting and analysis (Chapter 5), on which online students were clearly superior. The reason for this is not known.

Conclusions

In this study students appear equally satisfied with online and onsite courses. However, online students performed significantly better on a comprehensive multiple-choice exam, and thus, presumably learned more of the subject matter than their onsite counterparts. This result was not expected. It may be explained by differences in the two student groups that were not addressed by the study. Individual motivation and ability of the students probably

account for at least some of the difference. Variables such as age, major and grade point average could be collected in future studies to try to address possible differences in motivation and ability. 📖

Recommendations for revisions to current project

1. Continue the project through spring 2002. Collect and analyze data on age, major, and grade point averages for all students.
2. Include an analysis of student comments on the evaluation form.
3. Collect data on retention rates of students in the online and onsite courses.
4. Consider alternative methods of measuring student performance in addition to the comprehensive multiple-choice exam.
5. Attempt to enhance consistency between the online and onsite courses by adopting policies on homework collection and credit for assignments and quizzes.

Recommendations for future research

1. Compare the performance and attitudes of online and onsite students in other business courses.
2. Assess the performance in subsequent courses of students who have taken core courses online versus on-site.
3. Identify the characteristics of students and teachers that affect the likelihood of success in online courses.

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Notes