

# **An Investigation of Student Performance, Student Satisfaction, and Learner Characteristics in Online Versus Face-to-Face Classes** *RESEARCH*

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## **Abstract**

The purpose of this study was to investigate student performance, student satisfaction, and learner characteristics in online versus face-to-face delivery formats in accounting. Forty-four students, enrolled in either the face-to-face or online section of an accounting course, completed a survey assessing satisfaction, learning outcomes, and learner characteristics. Significant differences were found regarding satisfaction with learning and perception of the instructor. However, online learners displayed similar traits as their face-to-face counterparts. In addition, researchers compared pre-test / post test, homework, quiz, and exam scores to determine if delivery method affected learning. A significant difference was found between face-to-face and online students in post-test performance. Overall, the results of this study suggest that students perform as well in an online course as they do in a traditional face-to-face classroom and learner characteristics are similar for both online students and face-to-face classroom students. Post-test results indicate that students in an online class do not retain the information as well as those in a face-to-face class. These results, like others, show that online instructors continue to face challenges in promoting student participation and interaction in the course and overall satisfaction with learning. There is a need to replicate this study in other online courses in different disciplines.

**Keywords:** accounting education, online learning, face-to-face learning, learner characteristics

## **Introduction**

For the past seven years, enrollments in online classes have experienced significant growth in the United States (Allen & Seaman, 2010). In the fall of 2009, over 5.6 million students took at least one college course online, an increase of nearly one million students in just one year (Allen & Seaman, 2010). Between 2007 and 2011, online enrollment in colleges and universities throughout the United States doubled (Sheehy, 2012). Additionally, online learning has now become a critical part of the long-term strategies of institutional planners in higher education (Allen & Seaman, 2010). Moreover, students are now expecting to have the opportunity to enroll in courses taught online (Tanner, Noser, & Totaro, 2008).

In response to this growth in online course offerings, an abundance of research has emerged comparing the experience of students in distance learning courses against

those in the traditional face-to-face courses (Shachar & Neumann, 2010). However, very few of the overall studies focusing on online delivery have been conducted in the field of accounting (Bryant, Kahle, & Schafer, 2005; Salimi, 2007). This is troublesome given the fact that over 200 universities are currently offering online accounting courses (Bryant, et al., 2005). As more students enter into accounting education via distance learning, there is a growing need to understand the factors that affect student performance in courses delivered via distance delivery and to determine if online course delivery is as effective as the traditional, face-to-face delivery method. Therefore, the purpose of this research is to add to the body of knowledge concerning online accounting education by investigating student performance in online courses, variables that may affect students performance, and satisfaction with distance education.

## Literature Review

Just as in many other disciplines, accounting researchers have wrestled with the question of the effectiveness of online courses. To answer this question, studies in accounting education have utilized student performance and student satisfaction as measures of effectiveness. These studies have produced mixed results. In terms of the effect of the delivery method on student performance, two studies found no significant difference in student performance when using objective measures such as course grades or student grade point averages (Chen, Jones, & Moreland, 2010; Gagne & Shepherd, 2001). In these instances, students were enrolled in the same course, taught by the same instructor, and the course requirements for both sections were identical. Likewise, when comparing grade point averages and test scores of students who took online and face-to-face undergraduate accounting courses over a three-year period, student performance was equal across the two groups (Huh, Jin, Lee, & Yoo, 2009). These courses were also taught by the same instructor who used the same textbook, lecture notes, and exams for all of the courses. However, in a 1996 study involving accounting undergraduates enrolled in either an online, face-to-face, or open learning course using TV technology, both on-campus and open-learning students displayed a higher level of achievement than those enrolled in the distance education course (Waldmann & DeLange, 1996). Like previous studies, the level of achievement was derived from student scores on assignments, exercises, and examinations, the requirements for which were the same across all three sections of the course.

While the aforementioned studies used only course grades or grade point averages to investigate the effect of delivery method on student performance, Chen et al. (2010) devised other methods to further examine

potential differences in students enrolled in a cost accounting course. The first, a survey completed at the end of the course, asked students to rate their perception of specific learning outcomes and provide their expected grade for the course. The second, an exam, also completed at the end of the course, assessed the students' knowledge of the topics covered in the course. In general, students in the face-to-face course reported slightly better comprehension of course material and higher positive perceptions of the course than students enrolled in the online course. Additionally, the face-to-face students expected a better grade in the course and scored higher on four of the eighteen topic areas covered in the course. Online students scored better on only one course topic area and had lower grade expectations. While the results of this study favor the face-to-face delivery method in terms of student achievement, previous research as a whole provides no definitive answer regarding the effect of delivery method on student performance in accounting.

The second measure of effectiveness used by researchers in accounting was student satisfaction. Student satisfaction is critical to learning in both the face-to-face and distance education classroom (Moore, 2002). Investigators in accounting education have focused upon two main factors that may affect student satisfaction: Satisfaction with the delivery method and satisfaction with the amount of interaction with the instructor. As with research on student performance, the results are mixed. First, in terms of satisfaction with the delivery method, Vamosi, Pierce, and Slotkin (2004) asked students in an undergraduate introductory financial accounting course to rate their satisfaction with the distance learning method of delivery and its effectiveness in helping them learn course material. Students in this study alternated

between the traditional, face-to-face method of instruction and the online delivery instructional method. Students reported significantly lower satisfaction levels with the online delivery format. Specifically, the students believed that the course material was harder to learn using the online delivery method and that using the online delivery method hampered their ability to master course concepts. Likewise, Chen et al. (2010) compared students enrolled in either the online or face-to-face section of the same accounting course and found that those students enrolled in the face-to-face format reported greater levels of satisfaction with the course. These students also perceived a higher level of learning and a deepened interest in the subject area as compared to their online counterparts. However, two other studies in accounting report no differences in student satisfaction with the learning experience (Chen & Jones, 2007; Gagne & Shepherd, 2001). Chen and Jones (2007) surveyed students enrolled in either a traditional classroom section or blended learning section of a graduate-level accounting course taught by the same instructor with identical expectations and evaluation methods. Students in the blended learning section of the course reported similar results in terms of course satisfaction. In addition, there was no significant difference between the two groups in their rating of the course and the perception that the class deepened their interest in the subject matter. Similarly, Gagne and Shepherd (2001) found that students enrolled in an online section of an introductory graduate level accounting course rated the quality of the course just as high as those in the face-to-face section of the course. Therefore, as with previous studies on student performance, research into the effect of the delivery method on student satisfaction is inconclusive.

The second factor associated with student satisfaction and delivery method in accounting is instructor-student interaction. The quality and quantity of the interactions between students and instructors in distance education courses are connected to student learning (Swan, 2003). Therefore, the satisfaction of students with these interactions is important. Like previous research on student performance and course satisfaction in accounting, the results vary. One study reported no significant difference in student perceptions about interactions with the instructor between students enrolled in an online accounting course versus students enrolled in the traditional, face-to-face format (Chen et. al., 2010). However, an earlier study found the exact opposite. Gagne and Shepherd (2001) report that students in the online section of an accounting course were less satisfied with instructor communications than the students enrolled in the face-to-face section of the course. Furthermore, a study comparing a blended learning course and a traditional class found that those who were enrolled in the online portion were more satisfied with instructor interactions (Jones & Chen, 2008). Once again, while instructor interaction has been a focus of previous research, the results are varied regarding its impact.

While student satisfaction with the course and the amount of interaction with the instructor have factored prominently in accounting education research, other variables that may impact the effectiveness of the delivery method have received little attention. These variables may be placed into two broad categories: instructor behaviors and student characteristics. Four instructor behaviors affecting student satisfaction with online education have been discovered by accounting researchers. They are instructional clarity (Chen & Jones, 2007; Harnar, Brown, & Mayall, 2000; Lim,

Morris, & Kupritz, 2007), instructor feedback instructor availability, and instructor knowledge (Harnar et. al., 2000). The impact of three of these variables— instructional clarity, instructor feedback, and instructor availability—was confirmed by Swan (2003) in a review of research on the effectiveness of online education. Likewise, in a study of almost 400 students who have taken at least one online course in any content area, instructor feedback and instructor knowledge were found to impact student satisfaction with the delivery method (Eom, Wen, & Ashill, 2006). Students' level of motivation has been shown to significantly impact the effectiveness of the delivery method in accounting (Lim and Morris, 2009) and other disciplines (Eom et al.; Gibson, 1998). Likewise, research has identified general traits that promote success in online courses (Gibson, 1998), namely: whether or not the student is an independent learner, an active learner, a possessor of good organizational and time management skills, disciplined to study without external reminders, and able to adapt to new learning environments.

In conclusion, previous research into distance education in accounting compared student performance and satisfaction against those participating in traditional, face-to-face courses. The results of these studies have produced mixed results. Furthermore, accounting education researchers have paid little attention to the various instructor behaviors and learner characteristics that may affect the effectiveness of distance education courses.

To address these gaps, this study analyzed the satisfaction level and performance of students in an undergraduate accounting course delivered via two different methods: a traditional face-to-face course and an online-only course. Additionally, this research investigated instructor variables and learner

characteristics that may influence the effectiveness of online learning. The course was taught by the same instructor. Students in both course sections were given identical course material, quizzes, and exams. The researchers attempted to answer the following questions:

- Does the course delivery method affect student learning and performance?
- Does the course delivery method affect student satisfaction with and perception of learning?
- Does the course delivery method affect satisfaction with instructor behaviors?
- Do students in online courses report different characteristics than students in face-to-face delivery format courses?

This paper adds to the existing body of knowledge by examining instructor behaviors and student characteristics that may affect satisfaction with and performance in an online accounting course.

### **Data and Research Method**

Students in two sections of the same intermediate financial accounting course participated in a survey aimed at assessing the relative differences between online learning and face-to-face delivery. Thirteen students were enrolled in the face-to-face class, while 31 students were enrolled in the online class. Table 1 reports demographic data for the participants in the study, specifically gender and age.

**Table 1**  
*Class Demographics*

	Face-to-Face	Online
<b>Gender</b>		
Male	9	11
Female	4	20
<b>Age</b>		
18-24	12	10
25-30	0	12
31-35	0	3
36-40	0	4
41 & up	1	2

Both sections of the course were taught by the same instructor. The instructor used the same text, syllabus, assignments, and examinations for both classes. The course was the first semester of a three-course sequence of Intermediate Accounting. All students had completed two semesters of accounting principles before enrolling in the course. Topics covered included the environment under which accounting standards are established; the conceptual framework for financial accounting; the accounting cycle; requirements for the presentation of the income statement, balance sheet, and statement of cash flows; time value of money concepts; and accounting for cash, accounts receivable and inventories.

The face-to-face class met 2-3 times per week. Lecture was the primary mode used to cover course content. Assignments were turned in on the course management system. Quizzes were taken online via the course management system and exams were taken in class with the instructor present. Course content for online learners was delivered via a course management system through Blackboard. The online course was set up in a totally asynchronistic learning format. PowerPoints, lectures notes, and narrated slides were posted to the course site. Completed assignments were delivered to the instructor via the course management

system. Exams and quizzes were also taken via the course management system. Students in the online course were encouraged to ask questions by sending e-mails directly to the instructor. The instructor checked e-mail daily for student questions. A discussion board was set up on Blackboard for all students to discuss topics and ask for assistance on assignments. The instructor reviewed postings and commented when appropriate.

Student performance was measured via pre-test and post-test scores, graded assignments, and exams. Scores were compared to determine any differences in learning. At the conclusion of the course, participants were asked to complete a survey designed to assess learner characteristics, satisfaction with specified instructor behaviors, and perception of learning outcome. We followed studies (Harnar et. al., 2000; Lim & Morris, 2009; Lim et. al., 2007; Swan, 2003) to assess instructor behaviors by including questions covering instructional design, faculty interactions, and instructional quality. We followed other studies (Eom et al., 2006; Gibson, 1998) in how we assessed student characteristics. With respect to perception of learning outcome, we adapted items from Chen et al. (2010). Students responded to each of these items on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). We examined all differences for significance using the t-test with adjustments for unequal sample size.

### **Comparative Survey Results**

Because the class delivery methods may attract different learners, we compared responses relative to learner characteristics. Table 2 shows mean responses relative to items regarding learner characteristics. The results show that students enrolled in the face-to-face class perceived themselves as highly motivated, independent learners who

prefer active learning, whereas students enrolled in the online class were more likely to possess good organizational and time-management skills, be disciplined without the need for external reminders, and able to

adapt to new learning environments. However, the difference was not statistically significant.

**Table 2**  
*Differences in Learner Characteristics*

Item	Face-to-Face	Online	t-statistic	P-value
1. I am a highly motivated student.	4.24	4.19	0.14	0.893
2. I prefer active learning over passive learning.	4.24	4.23	0.04	0.971
3. I am an independent learner.	4.12	4.10	0.06	0.953
4. I have good organizational and time-management skills.	3.82	4	-0.55	0.585
5. I am disciplined with my studies and do not need external reminders.	3.63	3.65	-0.07	0.948
6. I am able to adapt to new learning environments.	4.12	4.13	-0.07	0.942

We compared responses regarding instructor behaviors to examine whether the delivery methods affected students' satisfaction with the instructor and/or the course. Table 3 shows the results for mean differences in satisfaction with instructor behaviors. The results suggest that students view face-to-face instruction as more effective than online instruction. In particular, students enrolled in the face-to-face class were significantly more satisfied than students enrolled in the online class

when the instructor provided valuable feedback, encouraged participation, offered extra help willingly, responded to students' questions promptly, and seemed knowledgeable about intermediate financial accounting. The results are not surprising, since the feedback and encouragement in the face-to-face format would be in real-time, whereas the online students may have experienced meaningful delays in communications.

**Table 3**  
*Satisfaction with Instructor Behaviors*

Item	Face-to-Face	Online	t-statistic	P-value
7. The instructor provides me with valuable feedback.	4.53	4.13	2.04	0.048
8. The instructor encourages participation.	4.82	4.3	3.14	0.003
9. The instructor is willing to provide extra help.	4.82	4.42	2.33	0.024
10. The instructor responds promptly to my questions.	4.76	4.39	1.98	0.053
11. The instructor is knowledgeable about the subject.	4.88	4.65	1.75	0.087
12. The instructor provided clear instructions.	4.65	4.48	0.87	0.391

Table 4 shows mean responses regarding students' self-reported perceptions of learning outcomes. The results again generally favor face-to-face delivery; statistically significant differences were found concerning student satisfaction with the learning experience and amount learned

in the course. Students enrolled in the face-to-face class expressed more satisfaction with their learning and believed that they learned more than students enrolled in the online class. These results may be due to the online class being presented in an asynchronous format.

**Table 4**  
*Perception of Learning Outcomes*

Item	Face-to-Face	Online	t-statistic	P-value
13. All in all, I am satisfied with my learning in this course.	4.71	3.90	3.28	0.002
14. I learned a great deal from this course.	4.41	3.90	2.35	0.024
15. My progress toward achieving course objectives.	4.18	3.93	1.15	0.258

Table 5 shows the results for differences in objective learning outcomes measured by pre-test, post-test, graded assignments, and exams. The t-statistic for pre-test between face-to-face and online classes was not significant, but the t-statistic for post-test was statistically significant at the 1% level. This result implies that face-to-face instruction is more effective since students in said course retained more of the course

information than students in the online course. In terms of overall student performance, no significant difference in student scores on exams and graded assignments was found between the two groups. The results support previous research that delivery methods do not have a significant impact upon student performance on exams (Gagne & Shepherd 2001; Huh et al., 2009) and homework (Tucker, 2001).

**Table 5**  
*Objective Learning Outcomes*

	Face-to-Face (N = 13)		Online (N = 31)		t-statistic	P-value
	Mean	Standard Deviation	Mean	Standard Deviation		
Pre-test	25.62	4.66	23.03	4.80	1.66	0.110
Post-test	34.46	5.08	26.26	7.41	4.23	0.000
Homeworks	259.97	94.01	279.51	51.55	-0.82	0.422
Exams	334.5	87.20	323.82	73.98	0.44	0.663

**Conclusion**

The purpose of this study was to investigate student performance, satisfaction with course, and learner characteristics in online versus face-to-face delivery formats. Overall, the results of this study suggest that students perform as well in an online course as they do in a traditional face-to-face

classroom and learner characteristics are similar for both online students and face-to-face classroom students. However, post-test results indicate that students in an online class do not retain the information as well as those in a face-to-face class. In addition, the students in the online class were not as satisfied with their learning experience and

did not believe that they learned as much in their online course as their face-to-face counterparts. Furthermore, there were significant differences in perception regarding the instructor. Online students' responses regarding the instructor's feedback, encouragement of participation, willingness to help and responsiveness to questions were significantly different from face-to-face students.

These results, like others, show that online instructors continue to face two major challenges. First, online instructors should find ways to successfully promote student participation and interaction in the course (Chang & Smith, 2008; Chen et al., 2010; Jones & Chen, 2008; Salimi, 2007; Watters & Robertson, 2009). Second, as online students report lower levels of satisfaction with their own learning than those in face-to-face courses (Vamosi et al., 2004; Gagne & Shepherd, 2001), distance educators

should strive to develop instructional techniques that will enhance student satisfaction. Further research into the variables that affect student satisfaction with their own learning is warranted.

Finally, this study has a number of limitations. First, the sample size was small. Replication of this research with a larger number of students is necessary. Second, this research was conducted in one university and in one course taught by the same instructor. While this potentially increases internal validity (Chen et al., 2010; Gagne & Shepherd, 2001), it also decreases generalizability. Lastly, it is unknown if the participants in this study had previously taken an online course. This is important as the amount and quality of experience with the online mode of delivery may affect the results (Chen et al., 2010). Therefore, future researchers should seek to obtain this information.

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