

Assessment of Students' Performance in an Online Managerial Accounting Course in Hybrid Classroom Setting

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Abstract

The purpose of this empirical research study was to replicate the original study of comparing students' performances in an online setting versus a hybrid classroom setting in an introductory managerial accounting course (Aly, 2013). A quasi-experimental research design was applied to test whether there is a significant difference in the learning outcomes, which occurs in these two different settings of media delivery. Students' performance was measured using scores from 12 weekly online assignments, two major online exams, a final examination held on campus and overall course performance. This study confirmed the prior research findings that students receiving only online instruction were as successful as students receiving hybrid classroom instruction and consistent over the two semesters. These findings suggest that course instruction and pedagogy are more important for student learning than the type of media delivery, and online instructors should focus their effort on quality in developing online courses.

Keywords: online learning, hybrid, managerial accounting, student performance

1. Introduction

Higher education institutes around the globe have long experimented with different learning environments to accommodate the needs of their students. Along with the traditional face to face classroom, we have seen the use of distance education (e.g., correspondence courses, televised courses, and, lately, online courses). In the last decade, online learning has become a leading growth sector in higher education. According to the Sloan Survey of Online Learning (2013), 32% of all registered students enrolled in at least one online course, resulting in an overall rise in online learning to 6.7 million students during the fall 2011 term, an increase of 570,000 students over the previous year (Allen & Seaman, 2013).

Online learning advocates have stated that online learning provides more flexible access to content and instruction at any time, from any place. It is more cost-efficient and enables 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 institutes offer their programs (Bassoppo-Moyo, 2006). However, educators continue to question the quality of student performance and learning in an online environment compared to the performance of students who attend traditional face-to-face or hybrid classes (Parsons-Pollard, Diehl Lacks, & Hylton Grant, 2008).

A review of over 200 qualifying 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 instructors of online classes should focus their effort on quality course design rather than the characteristics of media delivery. Other studies have also concluded that there are 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 and Holloman 2005; Weber and Lennon, 2007).

A recently meta-analysis and review of online learning studies found that, on average, students in online learning conditions performed better than those receiving face-to-face instruction (Means, Toyama, Murphy, Bakia & Jones, 2009). They reported that of 51 studies comparing online and face-to-face classes, eleven were significantly positive, supporting online or hybrid instruction, and only two supported traditional face-to-face. They further state that this finding is more positive than previous results most of which concluded that distance learning is effective as classroom instruction but no better. They concluded that the effectiveness of online learning approaches appears quite broad across different content and learner types. However, most of these studies addressed the question of the effectiveness of distance education learning compared to traditional face-to-face classroom or hybrid setting was conducted in non-technical settings which is presented in a descriptive format; hence the results may not apply to other technical area of studies such as accounting (Bryant, Kahle, & Schafer, 2005; Arbaugh, 2005).

In addition, the vast majority of these cited studies used students’ final grades when comparing the effectiveness of the online method to traditional face-to-face delivery. Other learning outcomes are needed to add insight into the assessment of students’ performance (Kan & Cheung 2007; Arbaugh et al., 2009). Tallent-Runnels et al. (2006) and Means et al. (2009) recommended that researchers should continue to study the issue of students’ learning outcomes in online versus face-to-face or hybrid class environments, and present results from well-designed strategies. To follow up to this recommendation, Aly (2013) implemented the constructivist approach in developing, designing, and examining the students’ performance using four different learning outcomes to evaluate the effectiveness of two types of media delivery (online and hybrid). He concluded that there is no significant differences between online and hybrid student achievement. Therefore, this study is intended to replicate (Aly, 2013) study of comparing students’ performances in an online setting versus a hybrid classroom setting in an introductory managerial accounting course over two different semesters using the same four different learning outcomes to enhance the assessment of the effectiveness of two types of media delivery.

2. Research Methodology

2.1 Research Design

A quasi-experimental research design was applied to students registered in four different sections of an introductory management accounting course taught by one instructor during summer 2011 and summer 2013 semesters. One section (115 students) and one section (104) were taught using hybrid instruction, involving a mixture of live and online learning activities during summer 2011 and summer 2013 semesters respectively. One section (194 students) and one section (175 students) were taught using only online instruction during summer 2011 and summer 2013 semesters respectively. This study assumes that students would enrol in a section offering the teaching mode that would best maximize their performance and access to content. In order to have a high degree of internal validity and achieve as close a comparison as possible between the hybrid and online sections, the same instructor taught all four sections—eliminating differences in confounding factors such as institutional milieu, grading standards, and instructor teaching style across sections.

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 supplementary learning aids such as assignment solutions, PowerPoint slides, and solutions to previous examinations.

2.2 Data collection

Student performance was compared using four different measures of learning, consisting of twelve weekly online assignments, two major online exams, and a final examination (held on campus). Both groups of students (hybrid and online) were required to register at WileyPlus platform to perform the 12 weekly on-line assignments and two major online exams during the summer 2011, and summer 2013 semesters. Each student was given 12 assignments for the 12 chapters required for the course. Each assignment was graded as pass or fail with two attempts for each question. To get a pass grade, students needed to get a minimum of 60% of the 100 marks available for each assignment. To get the full 10% grade allocated to the online assignments, students needed to pass 12 out of 12 assignments. These assignments were due on a weekly basis. After the due date students were able to review the assignment only for feedback purposes. These 12 weekly assignments were consisted of true/false statements, multiple choice questions, and problems requiring calculations, analyses, or short answers. These weekly assignments were essential in maintaining student activity while providing learners with timely, meaningful feedback and assessment. This created an element of motivation and an educational design that promoted a more active, collaborative, and participatory form of learning than those commonly found in the face-to-face environments.

Students in both groups were given two major online exams within three hours timed limit period. Students were required to complete a timed exam in one session but they were not allowed to return later to complete a timed exam like they did for the 12 weekly online assignments. These two major exams were made up of multiple choice questions, and problems requiring calculations, analyses, or short answers. Each assignment was graded out of 100 points with one attempt for each question. First major exam was worth 15% of the total mark in the course and second major exam was worth 15% of the total mark in the course. After the due date, students were able to review the assignment for feedback purposes only. These timed two major exams were critical to enforce time management as recommended in Chickering and Gamson's well-known *Seven Principles for Good Practice in Undergraduate Education* (1987). A common final examination was administered on campus to all students in both learning environments at the same time. The final examination was worth 60% of the total mark in the course. Student performances in 12 online assignments, two major online exams and the final examinations were used to perform the comparison between the two different learning environments for summer 2011 and summer 2013.

2.3 Statement of Hypotheses

The null hypotheses for this study are:

1. H_0 : There is no statistically significant difference in students' performance between the hybrid section and the online section in the 12 weekly assignments.
2. H_0 : There is no statistically significant difference in students' performance between the hybrid section and the online section in the first major exam.
3. H_0 : There is no statistically significant difference in students' performance between the hybrid section and the online section in the second major exam.
4. H_0 : There is no statistically significant difference in students' performance between the hybrid section and the online section in the final examination.
5. H_0 : There is no statistically significant difference in the overall students' performance between the hybrid section and the online section based on total marks.

3. Statistical Analysis and Results

Summary performance measures for students in both the hybrid and online sections and related tests in summer 2011 and summer 2013 are presented in table 1 through table 5.

The average scores on 12 weekly assignments reported in Table 1- PANEL A for summer 2011 and PANEL B for summer 2013 are the number of points awarded out of 10%. Students' performances on these assignments are used to test whether the mean scores on the 12 weekly assignments differ between the hybrid and online sections. In summer semester 2011, the results indicate that the average score on weekly assignments in the hybrid section (7.43) was not significantly different than that in the online section (7.28) at F Value 0.605, which measured the difference between hybrid and online variances at the 0.437 significance level. Thus, these results support the first hypothesis. It was also in summer 2013; the results indicate that the average score on weekly assignments in the hybrid section (8.96) was not significantly different from the average score achieved by students in the online section (8.87) at the 0.120 significance level. These results in summer 2011 and summer 2013 failed to reject the first null hypothesis. However, the average performance by the hybrid sections in this setting in summer 2011, and summer 2013 semesters are higher than the average performance by the online section. This higher average may be a result of interaction among the students, both inside and outside of class. It is common that a classroom setting produces much more collaboration among students than in an online learning setting.

Table 2- PANEL A, for summer semester 2011, and PANEL B, for summer semester 2013 below demonstrates the results of t-test analysis that was performed to test whether the students' performance on first major exam mean scores differ between the hybrid and online students. In summer 2011, the results indicate that the average performance of students in the hybrid section was not significantly different from that of students in the online section at F-Value 0.657, The average score on first major exam in the hybrid section (84.76) was not significantly different from the average of first major exam of online students (86.69) at the 0.418 level of alpha. In summer 2013, the results indicate that the average score on first major exam in the hybrid section (87.62) was not significantly different from the average of first major exam of online students (86.28) at the 0.552 level of alpha. We accept the second null hypothesis that there is no statistically significant difference in students' performance between hybrid students and online students in first major assignment.

Table 3- PANEL A, for summer semester 2011, and PANEL B, for summer semester 2013 below reveals the results of t-test analysis that was performed to test whether the students' performance in second major exams mean scores differ between the hybrid and online students. In summer 2011, the results indicate that the average score on second major exam in the hybrid section (86.46%) was not significantly different from the average of second major exam of online students (86.69%) at the 0.222 level of alpha. It was also in summer 2013; the results indicate that the average score on second major exam in the hybrid section (85.68%) was not significantly different from the average of second major exam of online students (86.23%) at the 0.138 level of alpha. These results failed to reject the third null hypothesis that there is no statistically significant difference in students' performance between hybrid students and online students in second major exams.

Table 4- PANEL A, summer semester 2011, and PANEL B, for summer semester 2013 below, discloses the results of t-test analysis that was performed to test whether the students' performance in final examination mean scores differ between the hybrid and online students. In summer 2011, the results revealed that the average score of final examination hybrid students was significantly different from the average final examination mean score of online students at the 0.00 level of alpha. Hybrid section performed higher than online section on this exam. They averaged 53.27% whereas the online students averaged 51.79%.

Therefore, we reject the forth null hypothesis that there is no statistically significant difference in students' performance between hybrid and online students in final examination mean in summer 2011. However, in summer 2013, the results point out that the average score of final examination hybrid students was not significantly different from the average final examination mean score of online students at the 0.100 level of alpha. Nonetheless, hybrid section performed higher than online section on this assignment. They averaged 67.16% whereas the online students averaged 56.94%. We accept the forth null hypothesis that there is no statistically significant difference in students' performance between hybrid and online students in final examination mean scores in summer 2013.

Table 5- PANEL A, summer semester 2011, and PANEL B, for summer semester 2013 below are the results of t-test analysis to address whether or not the students' performance in total mark mean scores differ between the hybrid and online students. In summer 2011, the results support the fifth null hypothesis that there is no statistically significant difference in students' performance between hybrid and online students in total mark mean score in the course. The results pointed out that the average score of total mark hybrid students was not significantly different from the average total mark mean score of online students at the 0.220 level of alpha. However, Hybrid section has higher average than online section in this analysis. They averaged 67.33% whereas the online students averaged 66.39%. It was also in summer 2013, the results support the fifth null hypothesis that there is no statistically significant difference in students' performance between hybrid and online students in total mark mean score in the course. The results revealed that the average score of total mark hybrid students was not significantly different from the average total mark mean score of online students at the .092 level of alpha. However, Hybrid section has higher average than online section in this analysis. They averaged 75.25% whereas the online students averaged 68.91%.

4. Conclusion

Online learning has become a new leading edge for higher education institutes around the globe. Understanding how to use this great learning technique has created new challenges for educators. A key concern of all educators involved in online instruction is learning outcomes. The major focus of this study was to compare the learning outcomes of students' performance between online learning setting and hybrid setting using four different learning outcomes to enhance the assessment of the effectiveness of two types of media delivery in an introductory managerial accounting course over two different semesters. Learning outcomes of this study were extensively explored through the use of students' performance in four different grade assessments. Students performed twelve weekly online assignments, two major timed online exams, and final examination held on campus. The results of this study reveal that students taking an online section are successful as students taking a hybrid section. Students were able to learn the course content without any effect of the type of course delivery media. The results from this study support the findings of prior research that learning outcomes of students' performance in online courses are similar to those of students in hybrid or traditional classes. It may conclude that course instructions and pedagogy are more important than the type of media delivery in effecting students' performance. Therefore, instructors of online classes should focus their effort on quality course design rather than the characteristics of media delivery.

5. Limitations of the Study

The study was conducted at a single university and for a single course, Managerial Accounting. Data was collected for two different semesters. The assignment of students to each section, hybrid setting and online section setting, was self-selection not randomly assigned. In addition, students' previous experiences of online courses were not taken into account in registering for the course. This study has not intent to reveal or to determine which media of delivery (hybrid or online) is "superior" or "inferior" to the other. This study did not attempt to measure the value of teacher/student and student/student interaction effect on learning outcomes.

This study concentrated on the form of delivery as the main factor influencing students' performance in the course. Other factors could have influenced the results such as: previous online course experience, proficiency with a particular classroom webpage (WileyPlus), work experience, or other student demographics. Another limitation of this study is the generalization of the finding should be dealt with caution since it was conducted among students taught at the same university by the same instructor. Simultaneously, this study benefited from the internal validity that resulted from having one instructor teach all online and hybrid sections. As a result, differences in factors such as institutional environments, grading standards, and instructor teaching style are minimized. Therefore, additional studies can provide information on the robustness of this study's findings. Consequently, future research is needed at other institutions using different instructors in order to see if the results are similar to those in the current study.

6. References

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Table 1. Summary statistics and t-test of Students’ Performances on 12 Weekly Assignments

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 Summer 2011						
Hybrid	115	7.43	1.83	0.17	0.605	0.437
Online	194	7.28	1.96	0.14		
PANEL B: Students’ Performances in 12 Weekly Assignments Summer 2013						
Hybrid	104	8.96	1.62	0.16	2.44	0.120
Online	175	8.87	1.86	0.14		

Table 2. Summary statistics and T-test of Students’ Performances on the First Major Exam

Section	Number of Students	Mean Score	Standard Deviation	Standard Error of the Mean	F-Value	Significance Level
PANEL A: Students’ Performances in the First Major Exam Summer 2011						
Hybrid	115	84.76	12.25	1.14	0.657	0.418
Online	194	86.69	54.28	3.90		
PANEL B: Students’ Performances in the First Major Exam Summer 2013						
Hybrid	104	87.62	11.54	1.11	0.355	0.552
Online	175	86.28	10.91	.82		

Table 3. Summary statistics and T-test of Students' Performances in the Second Major Exam

Section	Number of Students	Mean Score	Standard Deviation	Standard Error of the Mean	F-Value	Significance Level
PANEL A: Students' Performances in the Second Major exam Summer 2011						
Hybrid	115	86.46	10.89	1.02	1.50	0.222
Online	194	86.69	63.73	4.58		
PANEL B: Students' Performances in the Second Major exam Summer 2013						
Hybrid	104	85.68	9.60	.94	2.216	0.138
Online	175	86.23	12.16	.92		

Table 4. Summary statistics and T-test of Students' Performances in the Final Examination

Section	Number of Students	Mean Score	Standard Deviation	Standard Error of the Mean	F-Value	Significance Level
PANEL A: Students' Performances in the Final Examination Summer 2011						
Hybrid	115	53.27	23.92	2.23	14.75	0.00
Online	194	51.79	18.04	1.30		
PANEL B: Students' Performances in the Final Examination Summer 2013						
Hybrid	104	67.16	14.99	1.47	2.72	0.100
Online	175	56.94	17.03	1.29		

Table 5. Summary statistics and T-test of Students' Overall Performance in the Course

Section	Number of Students	Mean Score	Standard Deviation	Standard Error of the Mean	F-Value	Significance Level
PANEL A: Students' Overall Performance in the Course Summer 2011						
Hybrid	115	67.33	15.58	1.45	1.21	0.220
Online	194	66.39	16.14	1.60		
PANEL B: Students' Overall Performance in the Course Summer 2013						
Hybrid	104	75.25	11.35	1.11	2.86	.092
Online	175	68.91	13.10	.99		