Relative Effects of Distance versus Traditional Course Delivery on Student Performance in Hong Kong

Andy C.N. Kan
Open University of Hong Kong, Hong Kong

Lenis LM. Cheung
Open University of Hong Kong, Hong Kong

This study examined the performance of two groups of students taking an introductory course on Business Communication in Hong Kong offered through the distance-learning mode and traditional mode of delivery respectively. After controlling the background factors of the students (including age, gender, marital status, semester course load, relevant academic background, and previous academic achievement) which may affect their performance, it was found that students from the traditional class outperformed their counterparts from the distance-learning class at a significant level. After having all the background factors controlled, the only difference between the two groups was the number of face-to-face contact hours, suggesting that face-to-face communication is crucial for facilitating better student learning outcomes.

Introduction

Distance learning has grown to be an essential learning mode, and more and more conventional education institutions are involved in offering distance-learning courses (Gubernick and Ebeling 1997). While taking the advantage of the benefits offered by distance-learning mode, such as flexibility and mass delivery, it is essential for education institutions to ensure the quality of the courses offered through distance learning, especially there is continuous concern about the effectiveness of distance learning. There is some doubt that distance-learning classes do not have the same standard of conventional classes. In response to this, many studies have been carried out to compare the student performance of traditional and distance-learning classes.

These studies have provided valuable chances to examine the performance of the two classes. However, mixed conclusions have been drawn from these studies. Besides, there are still some gaps that need to be filled in the literature. First, the majority of these studies were on student performance in accounting, economics or finance courses. Second, the distance-learning classes involved in previous research were mainly on-line or TV classes. Third, only the average final grades were used when evaluating student performance. Given that the number of educational institutions offering distance-learning courses is increasing, more research should be done to compare student achievement of distance-learning and traditional classes 1) with a different subject discipline; 2) with a different distance-learning delivery method; 3) with a different approach to evaluate student performance. In this study, student performance of a business communication course offered in two different modes by the Open University of Hong Kong was examined.

Prior Research

In the literature, many studies compared the student performance of traditional and distance-learning classes. In Heiens and Hulse's study (1996), the final grade of 48 students studied an organizational behavior course in a distance-learning class and 71 students took the course through the traditional mode was examined. No significant difference in student performance was found between the two classes.

The finding of Ryan's study (1996) was consistent with that of Heiens and Husle's study (1996). Ryan (1996) examined the difference between the achievement of students who studied advanced mathematics through a distance learning mode and that of those who studied the same course in a traditional class. In comparing the final course grade of 630 students, he found that the achievement of the two groups did not differ significantly.

Similarly, Abraham (2002) found no significant difference in the student performance between the traditional class and distance-learning class. The researcher examined the achievement of 20 students studying a management information systems course in a traditional classroom setting and 22 students learning the same course in a virtual learning environment.

Same result was obtained in the studies of Dellana, Collins and West (2000) and Kekkonen-Moneta and Moneta (2002). In examining 199 students' course scores of an introductory management science course, which was calculated from homework (10%) and three examinations (90%) , Dellana et al. (2000) concluded that the student performance of the distance-learning class was comparable with that of the traditional class.

Kekkonen-Moneta and Moneta (2002) studied the examination performance of 414 students who took an introductory computing course through the traditional and distance-learning modes. The researchers reported that there was no significant difference in the learning outcomes between the traditional class and the on-line class.

Although most studies suggested that there was no significant difference in student achievement between distance-learning classes and traditional classes, some studies obtained a different result. For example, in comparing the average student scores of three classes studying the principles of microeconomics, namely face-to-face class, hybrid class and virtual class, Brown and Liedholm (2002) concluded that the students of the face-to-face class had a better performance than the students from the two distance-learning classes. Sauers and Walker (2004) also found that the students of the on-line classes showed better improvement in the area of writing than the students of the traditional classes.

Some studies, however, found that students of distance-learning classes did better than students of traditional face-to-face classes. Scay and Milman (1994) reported that 15 distance-learning students demonstrated a better performance than 18 students of a traditional class in three examinations in a principle of cost accounting course. Similarly, Schutte (1997) found that the distance-learning class out performed the traditional

class. In the study, 17 students took a social statistics course through the traditional mode, whereas 16 students studied the same course virtually. Because distance-learning education is getting more important and the mixed conclusions have been drawn from the literature, there is a need to have further study to compare student achievement of distance-learning and tradition classes.

The review of the literature has shown that prior research mainly focused on the student achievement of traditional classes and television classes or on-line classes. Undeniably, new technology has enhanced the development of on-line education in distance-learning environment; nevertheless, there are other distance-learning delivery methods (e.g. print medium, radio medium) offered to learners and these distance-learning options are still popular in many areas (e.g. India, China) (Zhang and Shin 2002). Therefore, the present study investigated student achievement of the distance-learning class using study packages.

The literature review has also shown that many of the previous studies were on student performance in mathematics, accounting, economics or computing-related courses, and very few (e.g. Sauers and Walker 2004) were related to business communication courses. It is argued that when the nature of the subject is different, the result may not be the same. Therefore, the present study examined the performance of students who studied business communication.

When evaluating student performance, most of the previous studies just compared the average final grades of distance-learning students and traditional students. Instead of simply comparing students' grades, this study would look at students' assignment scores and examination scores, as well as final course scores. To have a better comparison between the two classes, the present study also controlled the factors affecting students' academic performance when examining the student achievement.

Based on the prior research and considering the gaps in the literature, this study sought to investigate whether there is a difference in student performance between a distance-teaming class and a traditional class by examining the performance of students taking an introductory business communication course at the Open University of Hong Kong (OUHK).

Background

The study was conducted in the Open University of Hong Kong (OUHK), which offers programs through both the distance-learning mode and traditional face-to-face mode. For most of its undergraduate distance-learning programs, the OUHK adopts an open entry policy; no entry qualifications are required of students. Owing to this, distance-learning students have diverse backgrounds ranging widely in age and academic ability. After enrolling in a course, students receive a study package which contains specially structured learning materials such as written texts and CD-ROMs, and students are supposed to learn through self learning with the help of the learning materials. The OUHK also makes uses of other media, such as video and audio programs, computer software, WebCT, etc. On top of the study package, the University also offers a few optional

face-to-face tutorials to help students with their studies. These tutorials are designed to be 'lecture-less' and emphasize tutor-student interaction.

Whereas for the University's undergraduate face-to-face programs offered through the traditional mode, there is an entry requirement. Students are required to have completed their Form 6 or equivalent education. Therefore, these students have more homogenous backgrounds. Although students are not provided with a set of self-contained learning materials, they can assess the materials in the OUHK library and they can purchase a set of the materials if they want to. Students are provided with 60 hours of lectures/tutorials for a semester course and 120 hours of lectures/tutorials for a year course. Students are required to have at least an 80% attendance rate (i.e. 48 hours of lectures/tutorials).

The content of distance-learning courses in the OUHK is basically the same as that of the courses offered through the traditional mode, except the face-to-face session component. Therefore, if the finding of this study shows that the student performance of the face-to-face class was better than that of the distance-learning class, it could be argued that the face-to-face session component is very important for student learning.

Method

Data were collected from students taking an introductory business communication course at the OUHK between 2001 and 2002. The course was offered in two modes: distance-learning mode (B100) and traditional mode (B100F). Although the teaching modes were different, the content of B100 and that of B100F, including teaching topics, assignment questions, and examination paper, were basically the same. The students taken the course through the distance-learning mode (B100) were provided with a self-instructional study package and eight 2-hour face-to-face optional tutorials. The tutorials were conducted by part-time tutors who had tutored the course for at least three years. B100F, the traditional class, offered 30 2-hour lectures/tutorials. B100F was taught by a full-time lecturer who was also the course coordinator of B100.

Data that include each student's age, gender, marital status, semester course loads, academic qualifications, English proficiency level, and the course results were obtained from university records. In this study, the data of 997 students who completed B100 and 57 students who took B100F were collected. The academic performance of the students was measured by their course score (CS), which was calculated from two components: the continuous assessment score (OCAS) and the examination score (OES). The OCASs of B100 and B100F were based on the marks of three assignments that students were required to do, which accounted for 50% of the CS; the other 50% was derived from the score of a three-hour examination. Table 1 shows the basic statistics of the three scores of the two classes.

Literature has shown that there are many background factors affecting student performance. As the student backgrounds of B100 and B100F were very different, to have a better picture of the difference in student performance between the two classes, the background factors affecting student performance were controlled when comparing

the three scores of the students. To control the factors in the statistical analyses, the samples were regrouped according to the factors examined. Each of the factors was first controlled separately, and then the three scores of the two groups were examined again with all the factors controlled simultaneously.

Results

With respect of overall student academic performance, the statistics in Table 1 show that B100F students had an average CS of 52.98, OCAS of 54.79 and OES of 51.16, whereas B100 students had an average CS of 43.94, OCAS of 47.11 and OES of 40.70. In all three scores, B100F students significantly outperformed B100 students.

As previous research (e.g. Hoskins and Newstead 1997; Peiperl and Trevelyan 1997) showed that age was a factor affecting students' academic performance, the samples were first regrouped according to students' age. All B100F students were between 18-24 years old; therefore, only B100 students who were in this age group were included. When the age factor was controlled in the analysis, only the academic performance of 257 out of 997 B100 students was examined. The statistics in Table 2 show that B100F students had a better performance and the difference was significant.

Research results in the literature (e.g. Launius 1997; Cheung and Kan 2002) also indicated that gender had an impact on student performance. Female students were found to perform better in certain academic subjects, for example language, and men do better in other subjects, such as mathematics and science (Colman 1997; Kleinfeld 1998). The students of this study were therefore regrouped according to their gender. In this

Table 1: Overall Student Performance

OCAS		OES		CS	
B100F	**B100**	**B100F**	**B100**	**B100F**	**B100**
54.79	47.11	51.16	40.70	52.98	43.94
[57]	[997]	[57]	[997]	[57]	[997]
	(-6.305*)		(-6.657*)		(-7.210*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

Table 2: Student Performance with Age Factor Controlled

OCAS		OES		CS	
B100F	**B100**	**B100F**	**B100**	**B100F**	**B100**
54.79	41.01	51.16	34.27	52.89	37.69
[57]	[144]	[57]	[1441	[57]	[144]
	(-8.669*)		(-8.361*)		(-9.250*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

study, the B100 sample consisted of 573 female and 424 male students, whereas the B100F sample had 32 female and 25 male students. It is clearly shown in Table 3 that no matter male or female B100F students, they were found to have a significantly better performance than B100 students, which was consistent with the results gained from the age regrouping. The samples then were regrouped according to students' marital status, since marital status was found to have a significant impact on student performance in some prior studies (e.g. Peiperl and Trevelyan 1997). As none of the students of the traditional class were married, the married distance-learning students were excluded from the B100 sample. When the martial status factor was controlled, only 650 B100 students who were single were included in the analysis. The statistics in Table 4 showed that B100F students demonstrated higher CS, OCAS and OES, and the differences were significant.

Another factor that needed to be controlled in the samples was relevant academic background, which was found to be a strong factor affecting student performance in previous studies (e.g. Didia and Hasnat 1998). As the business communication course was taught in English in both classes, students' English proficiency level was used when the factor of relevant academic background was considered. In controlling this factor, the students were divided into two groups: those who gained a pass in the English

Table 3: Student Performance with Gender Factor Controlled

	OCAS		OES		CS	
	B100F	**B100**	**B100F**	**B100**	**B100F**	**B100**
Female	57.86	48.27	52.06	42.55	54.96	45.45
	[32]	[263]	[32]	[263]	[32]	[263]
		(-5.673*)		(-4.460*)		(-5.470*)
Male	50.86	45.54	50.00	38.21	50.43	41.91
	[25]	[238]	[25]	[238]	[23]	[238]
		(-3.768*)		(-5.056*)		(-5.070*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

Table 4: Student Performance with Marital Status Factor Controlled

	OCAS		OES		CS	
	B100F	**B100**	**B100F**	**B100**	**B100F**	**B100**
Single	54.79	44.61	51.16	38.31	52.98	41.48
	[57]	[337]	[57]	[337]	[571	[337]
		(-7.898*)		(-7.723		(-8.608*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

subject in the HKCEE, a public examination, and those who did not gain a pass in the said subject. Consistent with the above results, the statistics gained by controlling the relevant academic background factor in Table 5 show that B100F students significantly outperformed B100 students.

In a previous study done by Didia and Hasnat (1998), semester course load was found to have a positive relationship with student performance. Therefore, the factor of semester course load was also controlled in the analysis. Considering that the students of the traditional class had to take three other courses at the same time when they took the business communication course, only the B100 students who took the same number of courses as the B100F students did were included. Table 6 clearly indicates that B100F students had a significant better performance than B100 students, when the semester course load factor was controlled.

A major difference between the distance-learning and face-to-face undergraduate programs in the University is the entry requirement. An open entry policy is adopted in the distance-learning programs, whereas there is an entry requirement in the face-to-face programs. As students' previous academic achievement was found positively related

Table 5: Student Performance with Relevant Academic Background Factor Controlled (English Level)

	OCAS		OES		CS	
	B100F	B100	B100F	B100	B100F	B100
Without	50.75	43.63	50.00	34.53	50.38	39.12
HKCEE	[8]	[83]	[8]	[83]	[8]	[83]
		(-3.288*)		(-3.398*)		(-3.788*)
With	55.45	48.71	51.35	43.24	53.40	46.01
HKCEE	[49]	[372]	[49]	[372]	[49]	[372]
		(-4.871*)		(-4.706*)		(-5.263*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

Table 6: Student Performance with Semester Course Load Factor Controlled

	OCAS		OES		CS	
	B100F	B100	B100F	B100	B100F	B100
4 courses	54.79	46.90	51.16	40.16	52.98	43.57
	[571	[453]	[57]	[453]	[57]	[453]
		(-6.389*)		(-6.931*)		(-7.417*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

to their performance in many studies (e.g. Dellana et al. 2000; Cheung and Kan 2002), the B100 students who did not meet the entry requirement imposed by the face-to-face programs were excluded from the sample. When considering this factor, 501 B100 students were found to have the same previous academic achievement level as that of B100F students. In examining the three scores listed in Table 7, B100F students once again demonstrated a better performance than B100 students.

To control all the above factors, only students who had the same backgrounds (i.e. single, aged 18-24, and had finished F.6 or equivalent education) were selected. When considering the relevant academic background factor, there were only six B100 students and eight B100F students who did not gain a pass in the English subject in the HKCEE. As the number of students was too small to gain any significant conclusion, these students were excluded from the analysis. Similarly, when controlling the semester course load factor, adjustment was made to ensure a meaningful comparison. The number of B100 students taking four courses at the same time was too small, therefore B100 students taking less than four courses at the same time were also included in the analysis. As a result, only 21 male and 28 female students from B100F and 55 male and 57 female students from B100 were included in the analysis. Table 8 shows the statistical analysis on the student performance of the two classes with all the factors controlled. In all

Table 7: Student Performance with Previous Academic Achievement Factor Controlled

OCAS		OES		CS	
B100F	B100	B100F	B100	B100F	B100
54.79	48.85	51.16	43.54	52.98	46.23
[57]	[501]	[57]	[501]	[57]	[501]
	(-4.526*)		(-4.455*)		(-4.947*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

Table 8: Student Performance with All Factors Controlled

	OCAS		OES		CS	
	B100F	B100	B100F	B100	B100F	B100
Female	58.93	48.45	52.68	44.38	55.80	46.47
	[28]	[55]	[28]	[55]	[28]	[55]
		(-4.350*)		(-2.643*)		(-3.712*)
Male	50.82	39.54	49.57	31.91	50.20	35.75
	[21]	[57]	[21]	[57]	[21]	[57]
		(-3.998*)		(-4.389*)		(-4.517*)

Note: [ ] number of students; ( ) t-statistics; * 5% significant level

the three scores (i.e. CS, OCAS and OES), B100F students, both male and female, significantly outperformed B100 students. With all the factors controlled, the only difference remained between the two samples was the considerably more face-to-face contact hours that B100F students had.

Discussion and Conclusions

The results of the study show that students from the traditional class performed better than those from the distance-learning class, which are different from the results of many previous studies (e.g. Heiens and Hulse 1996; Schutte 1997; Abraham 2002; Kekkonan-Moneta and Moneta 2002). The results of this study strongly suggest that the face-to-face contact plays a very important role in student learning in the business communication course.

One of the possible reasons is related to the nature of the course studied in this study. As the course was a language-oriented course, unlike other non language-oriented courses such as accounting and economics, it is argued that having extensive practice is essential for students' learning. Although having enough practice is also important for skill-based courses like computing-related courses, it is probably more important for students studying business communication courses to have face-to-face contacts when they practice, for example, their oral communication skills. Offering more face-to-face sessions means students have more interactions, which may enable them to have more practice on what they have learnt.

Although some may argue that interactive elements like interactive exercises are built in the self-contained learning materials used in the distance-learning class, they could not provide simultaneous interactions as the face-to-face course does. The limited optional face-to-face tutorials provided in the distance-learning course probably could not totally compensate the shortfall. Simultaneous interactions offered in face-to-face contact sessions provide immediate feedback which enhances student learning and also serves as emotional support to students (Mirza 1998; Fund and Carr 2000). Without gaining enough support through simultaneous interactions with tutors and fellow students could be the reason why B100 students did not perform as well as B100F students.

Another possible reason concerns the age group of the samples in this study. The students included in this study were aged 18 - 24 and most of them probably just finished their secondary school education. As they were used to traditional face-to-face teaching method, they might find it difficult to adapt to a new learning mode, distance learning, which requires them to be self-disciplined and take an active role in their own learning. This study however has not provided evidence to prove this argument, therefore further study is needed before a conclusion can be drawn.

Although the results of this study show that student performance of the traditional class was better than that of the distance-learning class, we should not deny the contributions of distance learning education. Just like what McEwen (2001) suggests, distance learning education offers learning opportunities to those people that would otherwise have no access to higher education. The results of the study, however, have provided some

insights to business communication scholars who are involved in distance learning education. First, institutions offer business communication courses using a similar distance-learning delivery method as that of the OUHK should consider increasing more face-to-face contact sessions. When they make the decision, they should not just base on the cost but also take the nature of the course into consideration, so as to ensure the effectiveness of the course. For example, students taking a business communication course with a strong emphasis on oral communication skills are likely to be benefited by more face-to-face contact hours.

Second, institutions that are planning to offer distance-learning courses, for example, in the developing countries like mainland China, should carefully consider how many face-to-face contact sessions should be included when designing the courses. Considering that flexibility in learning is the distinctive feature for distance-learning courses, any restrictions that may hinder this flexibility should not be imposed on students taking these courses. Therefore, to maintain the advantage brought by flexibility, the face-to-face contact sessions offered in these courses should not be mandatory and distance-learning course providers should carefully strike a balance between flexibility and sufficient face-to-face contact support.

References

Abraham, T. (2002). Evaluating the virtual management information systems (MIS) classroom. *Journal of Information Systems Education,* 13 (2), 125-133.

Brown, B. W. and Liedholm, C. E. (2002). Can web courses replace the classroom in Principles of microeconomics? *Teaching Microeconomic Principles,* 92 (2), 444-448.

Cheung, L. L. W. and Kan, A. C. N. (2002). Evaluation of factors related to student performance in a distance-learning business communication course. *Journal of Education for Business,* 77 (5), 257-263.

Colman, A. (1997). Boys vs learning. *Youth Studies,* 16 (3), 3.

Dellana, S. A., Collins, W. H. and West, D. (2000). On-line education in a management science course - effectiveness and performance factors. *Journal of Education for Business,* 76 (1), 43-47.

Didia, D. and Hasnat, B. (1998). The determinants of performance in the university introductory finance course. *Financial Practice and Education, 8* (1), 102-107.

Fung, Y. and Carr, R. (2000). Face-to-face tutorials in a distance learning system: Meeting student needs. *Open Learning,* 15 (1), 3 5-46.

Gubernick, L. and Ebeling, A. (1997). 1 got my degree through E-mail. *Forbes,* 159 (12), 84-89.

Heines, R. A. and Hulse, D. B. (1996). Two-way interactive television: An emerging technology for university level business school instruction. *Journal of Education for Business,* 72 (2), 74-77.

Hoskins, S. L. and Newstead, S. E. (1997). Degree performance as a function of age, gender, prior qualifications and discipline studied. *Assessment and Evaluation in Higher Education,* 22 (3), 3 17-328.

Kekkonen-Moneta, S. and Moneta, G. B. (2002). E-Learning in Hong Kong: Comparing learning outcomes in online multimedia and lecture versions of an introductory computing course. *British Journal of Educational Technology,* 33 (4),423-433.

Kleinfeld, J. (1998). Why smart people believe that schools shortchange girls: What you see when you live in a tail. *Gender Issues,* 16 (P2), 47-63.

Launius, M. H. (1997). College student attendance: Attitudes and academic performance. *College Student Journal,* 31(1), 86-92.

McEwen, B. C. (2001). Web-assisted and online learning. *Business Communication Quarterly,* 63(3), 98-103.

Mirza, J. S. (1998). Distance learners' call for conventional ways of teaching. *Indian Journal of Open Learning,* 7 (2),171-177.

Peiperl, M. and Trevelyan, R. (1997). Predictors of performance at business school and beyond: Demographic factors and the contrast between individual and group outcomes. *Journal of Management Development,* 16 (5-6), 354-367.

Ryan, W. F. (1996). The effectiveness of traditional vs. audiographics delivery in senior high advanced mathematics courses. *Journal of Distance* Education, 11 (2), 45-55.

Sauers, D. and Walker, R. C. (2004). A comparison of traditional and technology-assisted instructional methods in the business communication classroom. *Business Communication Quarterly,* 67 (4), 430-442.

Scay, R. A. and Milman, M. 1. (1994). Interactive television instruction: An assessment of student performance and attitudes in an upper division accounting course. *Issues in Accounting Education,* 9 (1), 80-95.

Schutte, J. G. (1997). Virtual teaching in Higher Education: The new intellectual superhighway or just another traffic jam? <http://www.csun.edu/sociology/virexp. htm>.

Zhang, W. and Shin, N. (2002). Imported or indigenous? A comparative study of three open and distance education models in mainland China, India and Hong Kong. *Open Learning,* 17 (2), 167-176.

Contact email address: lwcheung@ouhk.edu.hk

Man-Shin Cheng
Department of Business Administration
National Formosa University
64 Wen-Hwa Road
Huwei, Yunlin
Taiwan

Wo-Chung Lin
Department of Business Administration
Nan Kai Institute of Technology
No.568 Jhongjheng Rd, Caotun
Nantou County
Taiwan 542

Awadh Kh. Al-Enezi
College of Business Administration
Kuwait University
P.O.Box No: 5486
Al Safat, Kuwait 13055

Li-Jung Tseng
Department of Business Administration
Ling Tung University
No.1, Lingtung Road
Taichung, Taiwan 408

Chien-Wen Lai
Dept of Accounting and Information
Asia University
500, Liufeng Road, Wufeng
Taichung, Taiwan 413

Chih-Hung Tsai
Pang-Lo Liu
Department of Industrial Engineering
and Management
Ta-Hwa Institute of Technology
1 Ta-Hwa Road, Chung-Lin
Hsin-Chu, Taiwan 30050

Tai-Kuey Yu
Dept of International Business
Southern Taiwan University of
Technology
1 Nan Tai Street, YungKang City
Tainan County, Taiwan

Guey-Sen Wu
Department of Finance
Ling Tung University
Nantou, Taichung
Taiwan

Andy C.N. Kan
Lenis LM. Cheung
School of Business and Administration
Open University of Hong Kong
30 Good Shepherd Street, Homantin
Kowloon, Hong Kong

Jenn Tang
Taipei College of Business
12F No.20 Hehan Road
Sindian City
Taipei County, Taiwan

Peng-Wen Chen
Wei-Chiang Hong
Shao-Lun Lee
Yi-Hsuan Yeh
Department of Information Management
Oriental Institute of Technology
No.58 Sec.2 Si-Chuan Road
Pan Chiao, Taipei
Taiwan 220

Chen-Tung Chen
Department of Information Management
National United University
No.1 Lien-Da, Kung-Ching Li
Miao-Li, Taiwan 36003