COMPUTER-ASSISTED INSTRUCTION: ENHANCING TRADITIONAL CLASSROOM TEACHING WITH ONLINE COURSE TECHNOLOGY

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ABSTRACT

Research has shown that computer-assisted instruction can help support traditional classroom teaching and improve learning. This paper examines how a traditional classroom in course in marketing was enhanced with computer-assisted instruction to support how the faculty member taught, and the ease and convenience with which students could learn. The paper contains findings from a study conducted at a regional university. The findings highlight some of the possibilities available to faculty to enrich their traditional classrooms with online course technology. Implications are discussed and recommendations provided.

INTRODUCTION

Technology is changing the convenience with which students can choose to learn. Courses offered online in an asynchronous format are available at the time and location preferred by the student. This could be at 5:00 a.m. before the kids wake up, during a noon lunch break or even during a break in Army field exercises. This flexibility means that students in isolated rural areas can use computer technology to access specialized courses not available locally.

There is no question that online courses appeal to students as evidenced by the rapidly increasing number of online students across the nation. One example of rapid growth in online education is reflected by West Texas A&M University (WTAMU), a regional university located in the Texas Panhandle. "WTOnline, the university's Internet-based course curriculum, started in the summer of 1997 with an enrollment of 24 students in one graduate level marketing course. This graduate level course in marketing initiated the College of Business's Internet-based option in the MBA program." (Terry, Owens, and Macy, 2001)

The rapid growth in online course delivery, and the leadership role of the Pickens College of Business, is reflected in comments made recently by Flavius Killebrew, provost and vice president for academic affairs. Killebrew reported that, "Fall 2002 enrollment in WTOnline totals 4,056. This represents 2,531 actual students taking online classes. The students are taking a total of 10,897 online credit hours this semester." (Werpney, 2002).

WTAMU has labeled their WTOnline courses as being equivalent of those taught in a traditional classroom. As indicated by Kaynana and Keesling (2000) in their article, "Development of a Web-Based Internet Marketing Course," online courses can indeed be well-planned and contain the amount and type of interactivity to enable students to take a more active role in learning.

Clark (2001) has described the online instructor's role as having "advanced from being a 'professor' of knowledge to a facilitator of learning experiences; from an evaluator to a coach; from a content specialist to a tour guide on the information superhighway." For years training specialists such as Robert Pike (1994), founder of the Bob Pike Group and author of *Creative Training Techniques*, and Thomas Cyrs (1997), author of *Teaching with the Merging Technologies*, have advocated the move of trainers from being a "sage on the stage" to a "guide on the side." The move to Web-based teaching, by virtue of the online course format, moves the instructor to a facilitative role. As described by Clark (2001),

"Rather than spending hours preparing lectures, the online instructor might spend hours surfing the Web for course-related information, creating Web pages detailing and linking to that information, designing discussion prompts and group projects, and participating in e-mail or bulletin board discussions with students."

If the number of rapidly increasing student enrollments in online courses are even a somewhat reliable indicator, students are finding the Web-based courses attractive.

Online courses with their Web-based structure and the rapid growth in enrollments at the undergraduate and graduate levels provide only one perspective of teaching today's students in higher education. The vast majority of higher education students still enroll in courses taught in traditional classrooms where face-to-face interaction is the norm. Helmi, Haynes, and Maun (2000) have suggested that the paradigm of teaching and learning in the traditional classroom may need to be redesigned.

PURPOSE OF THE STUDY

The purpose of this study is to consider how computer-assisted learning is currently being used to increase student learning and enhance traditional classroom productivity. A traditional classroom course in marketing, graduate level, was selected to test the use of computer-assisted instruction to support how the faculty member taught, and the ease and convenience with which students could learn.

COMPUTER-ASSISTED INSTRUCTION

Industry is learning that computer-assisted instruction is not only more cost-effective than conventional classroom training, but it can enhance the learning that occurs in the conventional classroom (Vaas, 2001). McDonald's Hamburger University, Thrifty Car Rental, and Circuit City are examples of organizations where a blended solution, the combination of e-learning with the traditional classroom, has reported success.

The State Department's Foreign Service Institute has also found advantages in using a blend of Internet-based and classroom learning. Janette Corsbie, distance learning program director at its School of Applied Information Technology, or SAIT, strongly encourages all of their users that are coming for traditional classes to do distance classes first because, "My personal opinion is that the blended environment is more effective than strictly [online courses] or [in-person instruction] (Vaas, 2001)."

The U.S. Army's Battle Command Training Program is also learning the advantages of getting staff better prepared for a class before they arrive in front of the teacher. E-learning is helping them achieve that objective (McCright, 2002).

The Department of Agriculture's Risk Management Agency has also discovered advantages to blending online distance learning. According to Jody Firmani, distance learning coordinator,

"The distance learning system is meant to augment current courses, not replace them....everyone who signed up for the in-person classes also browsed through the online version, probably to solidify the concepts covered in the classroom. '[Distance learning] won't totally replace [the classroom]'" (McCright, 2002).

Preliminary findings from a review of distance learning-related literature reflect evidence that computer-assisted instruction may well enhance the way an instructor in a traditional classroom designs and delivers instruction. The same literature indicates that students may enjoy the face-to-face interaction with the instructor but also find the added computer-assisted component a definite plus to their learning experience. A research project was designed to study the combination of computer-assisted instruction in a traditional classroom using a graduate level marketing class at a regional university.

HYPOTHESES

In a traditional classroom course, there is no reason to suspect that any differences in outcomes based on the gender or nationality of the student. Similarly, one would not suspect any differences based on age. Previous cumulative GPA, however, may produce such a difference. A student's GPA is a measure of performance, and reflects the student's intellect and effort. Thus, upon starting any new course, regardless of the delivery method, students with "high" previous cumulative GPAs would be predicted to do better than those with "low" GPAs. We thus hypothesize the following:

H1: There will be no significant difference in the means of total scores based on gender.

H2: There will be no significant difference in the means of total scores based on nationality.

H3: There will be no significant difference in the means of total scores based on age group.

H4: There will be a significant difference in the means of total scores between "high" and "low" previous cumulative GPA levels.

METHODOLOGY

Data were collected from a computer-assisted graduate Marketing Seminar course at a regional

southern university during Summer 2002. The class size was 30; there was no attrition during the course, yielding a complete data set for each student. A course web site maintained by one of the co-authors was used to make all lectures available to students. All components of the course (listed below) were available through the web site. Although the course was delivered on-campus, the web-based materials were similar to those used in an online course. The primary difference was that this particular course had face-to-face contact between professor and students.

The course included two essay exams, 15 homework assignments, two bonus exercises, and a written group project. All assignments except for the group project were submitted via an online form and database system. Students accessed their questions via standard web pages, worked offline to write their responses, and then cut-and-pasted their replies into text areas on the web pages. Upon submitting their work, their replies were entered into a database for viewing by the professor. The exams and homework assignments were all timed activities with specific deadlines for submission.

Points earned by each student were totaled and then used as the outcome measure (dependent variable) for the course. T-tests for independent means were calculated for gender, nationality, age group, and GPA level. For the age group variable, a cut-off of 30 was used to separate the students into two groups; for GPA, a cut-off of 3.25 was utilized.

RESULTS

Table 1 shows that there was no significant difference in mean total scores between genders, thereby retaining H1. The mean score for males was 449.9, while the mean for women was 458.6 (t=-1.401; p=0.172). While the males scored lower on average, their standard deviation was smaller than that for women (15.0 vs. 18.7), indicating a narrower range of scores. The results indicate that men and women performed fairly similarly in the course.

TABLE 1

T-Test For Independent Means
Gender vs. Total Score

Gender	N	Mean	t	df	sig.
1 (male)	15	449.9	-1.401	28	.172
2 (female)	15	458.6			

Examining the scores of US and international students required a dichotomization of the independent variable for meaningful statistical analysis. All international students, regardless of origin, were assigned to one group, and then compared to US students. The mean total score for US students was 456.5, while that for international students was 449.0 (t=1.101; p=0.280), with standard deviations of 17.9 and 15.2 respectively. Thus, H2 is retained.

TABLE 2

T-Test For Independent Means
Nationality vs. Total Score

Nationality	N	Mean	t	df	sig.
1 (US)	21	456.5	1.101	28	.280
2 (Int'l)	9	449.0			

The age level variable also required a cut-off. Since the university's average age for MBA student is approximately 30, this was used as the break point. Mean scores for students age 30 and up was 457.1, while for the remainder it was 452.6 (t=0.677; p=0.504). H3 is thus retained, and we conclude that students of either age group score similarly.

TABLE 3

T-Test For Independent Means
Age vs. Total Score

Age	N	Mean	t	df	sig.
1 (>=30)	11	457.1	.677	28	.504
2 (<30)	19	452.6			

Finally, the previous cumulative GPA variable required a cut-off. A value of 3.25 was used as the breakpoint; the average GPA in the program is about 3.50, while students must maintain a 3.00 to continue in the program. A conservative value of 3.25 thus isolates the lowest GPA students from the remainder of their peers. Thus, anyone with a previous cumulative GPA of 3.25 or higher was classified as "high," while the remainder were classified as "low."

The mean scores of those in the "high" category were 459.3, while that of the "low" group was 444.2 (t=2.452; p=0.021). The standard deviations were 14.0 and 19.2 respectively. H4 is thus retained, and we conclude that the level of previous cumulative GPA is a significant differentiator in total scores.

TABLE 4

T-Test For Independent Means

GPA vs. Total Score

GPA	N	Mean	t	df	sig.
1 (>=3.25)	20	459.3	2.452	28	0.021
2 (<3.25)	10	444.2			

Implications

The results indicate that a computer-assisted course produced no significant difference in outcomes, except for "high" and "low" cumulative GPA groups. Neither gender, age, nor nationality had any bearing on a student's final grade.

While student satisfaction with the course or its format was not measured, the results imply that students accessed the materials (lectures, assignments, etc.) and performed fairly uniformly. A separate analysis of the co-author's web site revealed that the average student had 140 web page "hits," which was more than adequate for accessing all the necessary materials for the course (Gerlich, 2002).

Limitations and Future Research

The findings are limited in that they pertain to only one graduate Marketing course taught with a hybrid format. Future research should seek to compare both online and on-campus course outcomes, as well as other courses in the MBA curriculum (both required and elective courses).

The sample size is also a limitation. A course with 30 students is small for meaningful statistical conclusions to be drawn, but do offer a valid basis from which future research can be conducted.

A further limitation is that only four independent variables were considered. For example, GMAT score could have been analyzed, but since some of the students had not yet completed this exam, this variable could not be used.

Another independent variable that could be studied is level of computer competence, since the course relies heavily on an internet component. A difference in final scores may be apparent between those who have a strong computer background and those who do not.

Yet another limitation is that the course included only the assessment of student written materials.

Had objective testing methods been used, it is possible that other differences may exist.

CONCULSIONS

The study indicates that a computer-assisted course can work well for most students. Although a significant difference in final grades was noted for "high" and "low" GPA levels, no one did poorly in the course.

A computer-assisted course is only slightly removed from an online course, but is still a hybrid of traditional classroom and web-based learning methods. Students for whom an online course is not appealing, or who need or desire regular classroom contact, may find a computer-assisted course to offer the best of both teaching methods.

Perhaps the biggest drawback to a computer-assisted course is the added burden on the professor to write and program course content. A computer-assisted course may approach an online course in amount and rigor of web programming, and the professor must be proficient in developing materials for internet-based delivery.

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