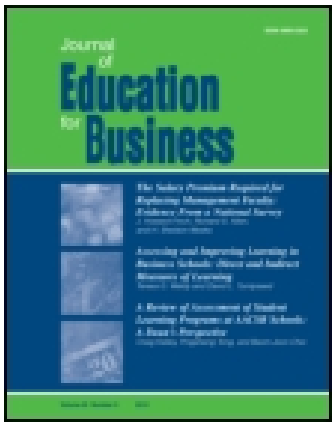

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Assessing Instruction Modes for Master of Business Administration (MBA) Courses

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Assessing Instruction Modes for Master of Business Administration (MBA) Courses

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ABSTRACT. In this article, the author presents empirical results concerning the effectiveness of campus, online, and hybrid (i.e., a mix of campus and online) instruction in business education. The sample is derived from graduate students enrolled in economics, computer information systems, and finance courses at a regional university. The author investigates assessment of enrollment, attrition, grade distribution, faculty evaluation, course evaluation, and explicit achievement of learning objectives across the various instruction modes. Results show student performance on class assignments to be equivalent across the three instruction modes. Holding ability, effort, and demographic considerations constant, students enrolled in online courses scored over 4% lower on the final exam than campus or hybrid students.

Keywords: assessment, hybrid delivery, MBA, online

The online mode of instruction has become a major part of higher education and an important strategic initiative for business schools. The U.S. Department of Education estimates that 100 new college courses are added to the online format each month (National Center for Education Statistics, 2001). In recent years, researchers have debated the efficacy of online instruction as the mode has become ubiquitous (Bowman, 2003; Fortune, Shifflett, & Sibley, 2006; Lezberg, 1998; Okula, 1999; Terry, 2000; Worley & Dyrud, 2003). One alternative to online instruction is the hybrid instruction mode. The *hybrid mode* combines some of the inherent features of the online (e.g., time independence) and campus (e.g., personal interaction) environments. My purpose in this study is to compare student satisfaction and performance in the campus, online, and hybrid instruction modes in business education using standard indirect and direct assessment techniques. The research is based on graduate courses in computer information systems, corporate finance, and macroeconomics targeted to master of business administration (MBA) students at a regional university.

This manuscript is organized as follows: (a) an overview of concepts and definitions important to distinguishing the three instruction modes, (b) a description of the role of assessment within the context of this study, (c) assessment results relating to enrollment, attrition/drop rate, grade distribution, student evaluations of faculty and course, and learning outcomes, (d) an empirical model to test the effectiveness of instruction mode while controlling for effort, ability, and demographic considerations, and (e) conclusions and implications.

Campus, Online, and Hybrid Modes of Instruction

Experts have not always agreed on fundamental characteristics of the campus, online, and hybrid instruction modes, but I have put forth a generic description of each instruction mode to facilitate the research process. Campus-based or traditional instruction is probably the easiest to understand. The *campus mode* is characterized by student or faculty interaction via lectures, discussion, and exams on campus at scheduled times and days. There are approximately 45 contact hr associated with a 3 credit-hr course in most traditional campus courses. People often perceive the personal interaction between students and faculty associated with campus courses as a characteristic that facilitates high-quality learning. In addition, most professors were educated via traditional campus instruction and are familiar with the learning environment from the perspective of student and instructor.

The *online mode* of instruction replaces the walls of the classroom with a network of computer communication. Some of the benefits of online instruction are its temporal, geographic, and platform independence and its simple, familiar, and consistent interface (Kearsley, 1998; Okula, 1999). Some of the drawbacks are (a) sophistication and creativity restricted by hardware and software compatibility, (b) resistance to shift to new and alternative teaching and learning paradigms, (c) privacy, security, copyright, and related issues, and (d) a lack of uniform quality (McCormack & Jones, 1998).

Online instruction provides flexibility for students in that it reduces the often-substantial transaction and opportunity costs associated with traditional campus offerings. This flexibility in structure is countered by potential problems including (a) lack of personal interaction (Fann & Lewis, 2001), (b) the elimination of a sense of community (James & Voight, 2001), and (c) the perception of lower quality (Terry, 2000). In addition, faculty often have reservations about preparing a new online course because of the large initial time investment involved, estimated to be 400 hr per new course (Terry, Owens, & Macy, 2000).

Not all students can take campus courses, and not all want online instruction. The general problem with campus courses for working professionals is the time constraint. In contrast, the most common complaint about online courses is the lack of personal interaction between students and professor that is often needed to facilitate the learning process, especially for advanced coursework.

The hybrid mode is a potential solution that combines the positives from both modes. There are approximately 18–25 contact hr associated with a 3-credit-hr course in a hybrid mode. The reduced classroom contact time is offset by computer-based communication, which includes lecture notes, assignments, and e-mail correspondence. Technology changes are rapidly giving faculty more capability to offer online support to campus courses as more and more educational institutions adopt Web-based systems that provide numerous tools such as a class e-mail system, space to post lecture notes, a depository for syllabi, chat rooms, and several other options.

The hybrid mode allows busy graduate students and working professionals limited in-class time, while maintaining an adequate amount of contact time with faculty and peers. The obvious criticism of the hybrid format is the potential that the instruction mode does not combine the best attributes of the campus and online formats but the worst attributes. The potential negative attributes of hybrid instruction include (a) a feeling that there is an inadequate amount of time to cover lecture topics, (b) double preparations for the instructor because the mode requires both lecture and online materials, and (c) a lack of time and geographic flexibility with respect to the campus lecture component.

The Role of Assessment

The assessment of student learning has become a critical issue in higher education. In 2003, the Association to Advance Collegiate Schools of Business (AACSB) accreditation membership approved assessment standards that explicitly recognized student learning as a fundamental goal (Trapnell, 2005). Regional and college-of-business accreditation agencies have increasingly mandated assessment of institutional and program effectiveness throughout the last decade. Standard 9 for AACSB accreditation requires that all programs, majors, areas of emphasis, and locations have the opportunity to receive instruction from appropriate qualified faculty. Standard 12 includes a statement of faculty, staff, and administrator responsibility to evaluate instructional effectiveness, continuously improve instructional programs, and seek instructional innovation. The two standards implicitly and explicitly compel the need to compare the quality of instruction across various modes and locations.

METHOD

This study was conducted at a public university located in the Southwestern part of the United States. The institution is midsized with a total enrollment of approximately 7,500 total students, (1,000 undergraduate business students, and 350 graduate business students). The goals and learning objectives applied in this study are similar to many other regional institutions. The explicit goals of the MBA program are to give students competency in business knowledge and skills for advancement to high-level management positions in both private and public sectors of the global economy. The MBA program should provide the optimal condition for learning through an application of business theory to experience. The program is designed to serve the needs of both fully employed and full-time students. The program and learning outcomes are guided by several principles, including the following, which are central to this study: (a) MBA graduates will be prepared to analyze current issues in the field of business, including the moral and international dimensions of business, and to apply efficient solutions, (b) MBA graduates will develop the ability to effectively integrate team-building skills, and (c) MBA graduates will demonstrate knowledge of advanced business concepts.

The next two sections of this study center on indirect assessment results via student survey data and direct assessment results via student performance. The direct assessment results are limited because most of the data are derived by the faculty members teaching the courses and not by a group of faculty as part of a course-embedded assessment process (Martell & Calderon, 2005).

Multiple Comparisons of Course and Learning Assessment Results

Is there a difference with respect to student learning in campus, online, or hybrid courses? I address this question on the basis of data derived from 356 MBA students enrolled in required computer information systems (CIS), corporate finance (FIN), and macroeconomics (ECON) graduate courses in the years 2000–2006. The study cohort consists of 366 campus (96 in CIS, 118 in FIN, and 152 in ECON), 312 online (96 in CIS, 115 in FIN, and 101 in ECON), and 198 hybrid (45 in CIS, 68 in FIN, and 85 in ECON) student course enroll-

ments for a grand total of 876. The majority of the 356 students in the research cohort enrolled in all three courses. The instructors made every effort to keep the content and course requirements consistent across the 3 instruction modes to make multiple comparisons viable. The sample contains a total of 32 course sections. Homework or project assignments determined 25–50% of the student grade in each course, and a proctored final exam accounted for 33–50% of the student grade. The study did not include 26 sections of computer information systems, corporate finance, and macroeconomic courses offered in the research timeframe because class organization and grading was not consistent with the research model. Students dropped 46 individual course enrollments without taking the final exam, yielding a final usable sample size of 830 students enrolled in the three courses. Seventy percent of the students in the survey had full-time jobs, 52% had at least one child, 60% were male, 17% were foreign nationals, and 84% lived within a 1-hr drive of campus.

The statistical methodology was a nonparametric approach to comparing the three instruction modes. The Kruskal-Wallis test offers the most powerful test statistic in a completely randomized design without assuming a normal distribution, is designed to be sensitive against differences among means in the k populations, and is extremely useful when the alternative hypothesis is that the k populations do not have identical means. I used the Kruskal-Wallis test in this study to test the null hypothesis that the k assessment variables in the three modes of instruction are derived from an identical distribution function. For a complete description of the Kruskal-Wallis test, see Conover (1980). The specific equations used in the calculations were as follows:

$$N = \sum \text{ni with i} = 1 \text{ to k} \quad (1)$$

$$R\text{i} = \sum \text{j}R(\text{Xij}) \text{ with j} = 1 \text{ to ni} \quad (2)$$

$$R\text{j} = \sum \text{iOij } R\text{i with i} = 1 \text{ to c} \quad (3)$$

$$S2 = [1/(N\text{-}1)] \; [\sum \text{i ti } R\text{i}2 - N(N+1)2/4] \text{ with i} = 1 \text{ to c} \quad (4)$$

$$T = (1/S2) \; [\sum \text{i}(R\text{i}2/\text{ni}) - N(N+1)2/4] \text{ with i} = 1 \text{ to } k \quad (5)$$

$$| \, (R\text{i}/\text{ni}) - (R\text{j}/\text{nj}) \, | > \text{t1-a/2} \; [S2(N\text{-}1\text{-}T)/(N\text{-}k)]1/2 \; [(1/\text{ni}) + (1/\text{nj})]1/2 \quad (6)$$

where R is defined as the variable rank, and N is the total number of observations. The first three equations yielded the average ranks. I used Equation 4 to calculate the sample variance and Equation 5 to calculate the test statistic. If the null hypothesis is rejected, Equation 6 will provide multiple comparisons across the k sample populations.

Table 1 presents a multiple comparison of instruction modes using the Kruskal-Wallis test across the common course assessment criteria of enrollment, attrition/drop rate, grade distribution (measured on 4.0 scale), student evaluation of faculty (measured on a 4.0 scale), student evaluation of course (measured on a 4.0 scale), student percent score on business application assignment, and student percent score on team assignment. The results indicate that average enrollment for the online instruction mode is significantly greater than the campus or hybrid alternative. Average enrollment for the online mode was over 30% higher than the alternative campus or hybrid mode. The results imply that the convenience associated with online instruction was attractive to the study cohort.

In this study, *Attrition/drop* is defined as the difference between the numbers of students officially enrolled in the course on the first class day versus the number officially enrolled on the last class day. The results indicate a clear difference in attrition/drop rates across the instruction modes. The campus and hybrid attrition rates of 3.83% and 4.04% are significantly lower than the online rate of 7.69%. One possible explanation of this result is that student and faculty personal interaction is an important component in student retention. The fluidity and independence associated with the online mode may also result in a relative ease of exit. Another possible explanation is that the campus and hybrid modes have a greater probability of meeting the expectations of students with respect to content and course procedures. Many students have preconceived notions about online instruction (e.g., I can finish the work anytime I want before the semester ends) that may not be true.

The third assessment variable in the study was class grade distribution. This broad measure of student performance indicates that the research cohort earned significantly lower grades when completing coursework in the online format. The grade distribution for the hybrid mode is approximately the same as for the campus mode. It appears that the campus and hybrid formats are superior and the online mode is inferior in quality based on relative student performance, although a more rigorous methodology with control variables should be employed before any broad conclusions can be reached. The results are tempered by the observation that

TABLE 1. Multiple Comparison of Campus, Online, and Hybrid Instruction Modes

Variable	Instruction mode: Campus (n = 366)	Online (n = 312)	Hybrid (n = 198)
Course offered	14	9	8
Average enrollment	26.1	34.6*	24.8
Attrition/drop rate (%)	3.83	7.69*	4.04
Class grade distribution (4.0 scale)	3.46	2.98*	3.40
Faculty evaluation (4.0 scale)	3.42	3.27	3.31
Course evaluation (4.0 scale)	3.41	2.86*	3.39
Score on business application assignment	92.2%	89.8%	93.3%
Score on team assignment	93.1%	93.3%	94.2%

*Statistically different from the other two instruction modes at $p < .05$.

faculty may be more inclined to give students the benefit of the doubt with respect to grading as the level of personal interaction increases, which could result in a grading penalty for online students. It is also possible that students selecting the campus or hybrid modes are more concerned about faculty and peer contact as a means of ensuring quality control. Students who prioritize the perception of higher quality may simply be more serious and successful with respect to classroom performance. Hence, the results may be biased by higher quality students self-selecting the campus and hybrid modes. Another possible explanation is that students who enroll in campus or hybrid courses tend to have lifestyles without excessive time rigidities, which may lead to opportunities to study more and earn higher grades. A final observation is that many of the lower course grades (e.g., C or below) are derived from the relatively quantitative corporate finance course, especially the online version of the corporate finance course. If corporate finance is eliminated from the data set, the statistical difference across instruction modes is eliminated.

The next two assessment terms in Table 1 are student evaluations of faculty and course. The results indicate that student evaluations of faculty and course are significantly lower for the online format than for the campus or hybrid alternatives. The implication is that students are not as satisfied with online instruction. An obvious reason for the result is the potential confounding effect caused by the lower grade distribution. The lack of direct personal interaction is another possible reason why student evaluation of the online professors and courses are relatively low. Annoying pop-up windows implicitly requiring students to file evaluations in the online format is another possible explanation for the lower evaluations, assuming students forced to complete evaluations do so with a negative temperament. Essentially, students in the campus and hybrid instruction modes have the opportunity to complete course or faculty evaluations but are not assaulted with reminders if they choose not to. Another noteworthy explanation is the structural change in the quality of the online mode during the years 2000–2006. Online technology for course delivery was very basic and heavily text-based in the year 2000 in response to the constraint that many students still used dial-up service for course connection. By the year 2006, most students had gained access to high-speed Internet service that is more compatible with dynamic online delivery tools such as streaming video and podcast. It is possible that much of the student dissatisfaction with the online mode of instruction may be driven by the static delivery forced by limited user-end speed at the beginning of the sample that is quickly being eliminated by technological advances.

The results shown in Table 1 relate to learning outcome objectives. As noted in the previous section, MBA students enrolled in this specific regional program are expected to analyze current issues in business, apply efficient solutions, and develop the ability to effectively integrate team-building skills. The courses in this study employ a current-issues assignment or a second assignment requiring group completion as a means of explicitly measuring student performance. The results of Table 1 reveal that there is not a statistical difference in student performance on either assignment regardless of instruction mode. The results imply that instruction mode has little impact on ability to apply solutions to business issues or work in teams. The nature of the applied issues assignment gives each student ample opportunity to ask questions and seek moderate direction from the course instructor. A student struggling on an applied assignment can obtain course instructor assistance, negating learning gaps that may exist across instruction modes. More significantly, it is possible that online students do very well on team assignments because they feel a great need to connect with other students and create an effective learning community in this nontraditional mode of instruction (Arbaugh, 2001).

Assessing Student Performance by Employing Control Variables

The assessment results from the previous section provide a broad multiple comparison of the campus, online, and hybrid instruction modes. In this section, I compare the effectiveness of the instruction modes by using a more rigorous methodology. Davisson and Bonello (1976) propose an empirical research taxonomy in which they specify the categories of inputs for the production function of learning. These categories are (a) human capital (e.g., admission exam score, GPA, discipline major), (b) utilization rate (study time), and (c) technology (e.g., lectures, classroom demonstrations). Using this taxonomy, Becker (1983) demonstrates that a simple production function can be generated that may be reduced to an estimable equation. Although his model is somewhat simplistic, it has the advantage of being both parsimonious and testable. A number of problems may arise from this research approach (Becker; Chizmar & Spencer, 1980). Among these problems are errors in measurement and multicollinearity associated with demographic data. Despite these potential problems, there must be some starting point for empirical research into the process by which business knowledge is learned.

The choice as to what demographic variables to include in the model presents several difficulties. A parsimonious model allows one to avoid potential multicollinearity problems. Although other authors have found a significant relationship between race, gender, or age and learning (Hirschfeld, Moore, & Brown, 1995; Siegfried & Fels, 1979), the terms are not significant in this study. A number of specifications are considered using race, age, work experience, gender, hours completed, and concurrent hours in various combinations. Inclusion of these variables into the model affected the standard errors of the coefficients but not the value of the remaining coefficients. For this reason, they are not included in the model. University academic records are the source of admission and demographic information because of the potential biases identified in self-reported data (Maxwell & Lopus, 1994). There are a total of 820 usable observations in the sample (56 observations were eliminated from the original sample because students dropped a course; Douglas & Joseph, 1995).

The model developed to analyze student learning relies on a production view of student learning. Assume that the production function of learning business concepts at the MBA level can be represented by a production function of the form

$$Yi = f(Ai, Ei, Di, Xi) \quad (7)$$

where **Y** measures the degree to which a student learns, **A** is information about the student's native ability, **E** is information about the student's effort, **D** is a dummy variable (0, 1) indicating demonstration method or mode, and **X** is a vector of demographic information. As noted above, this can be reduced to an estimable equation. The specific model used in this study follows:

$$SCOREi = B0 + B1ABILITYi + B2HWi + B3NETi + B4HYBRIDi + B5FOREIGNi + B6MAJORi + B7TIMEi + B8NET \times TIMEi\ ui. \quad (8)$$

The dependent variable used in measuring effectiveness of student performance is score (SCORE) on a comprehensive final exam. The variable associated with the final exam score is measured in percentage terms and serves as a proxy for measuring student knowledge of advanced business concepts. The student's academic ability (ABILITY) is based on the composite score of the Graduate Management Admission Test (GMAT) exam plus the product of the upper-level (last 60 hr) undergraduate grade point average (GPA) and the number 200. For example, a student with a GMAT score of 600 and a 3.0 GPA has a composite score of 1200. The ABILITY variable equalizes the weight of GPA and GMAT because both have a maximum limit of 800. Many business colleges use the composite score as part of the admission process. The percentage score on the homework assignments (HW) measures student effort. The homework grade is used to measure effort because students are not constrained by time, research material, or ability to ask the course instructor questions when completing course assignments. Enrollment in a campus, online, or hybrid course is noted by the categorical variables NET (online course) and HYBRID. The demographic variable FOREIGN distinguished international students from domestic students. Foreign MBA students that are in the United States on a student visa are required to enroll in at least 6 hrs of campus courses each semester and do not have the option of enrolling exclusively in online courses. The variable MAJOR is a human capital variable identifying students with an undergraduate major in the discipline of the course (e.g., economics undergraduate major in the macroeconomics MBA course). I anticipated that students with an undergraduate-discipline-specific background would have an advantage over other students without the explicit discipline foundation. It includes the variable TIME, which denotes trends related to student performance. The time frame of the study is 2000–2006, with 2000 classified as the initiation year. The model includes the interaction term NET*TIME to capture trends that may exist specific to online courses. I anticipated that the effectiveness of online instruction would increase over time as faculty and students become more comfortable with the mode and as technological advances improve content delivery options.

Table 2 shows the results from the ordinary least squares estimation of Equation 8. None of the independent variables in the model have a correlation higher than .48, providing evidence that the model specification does not suffer from excessive multicollinearity. Equation 8 explains 62% of the variance in final exam performance. Five of the eight independent variables in the model are statistically significant.

The most interesting result in Table 2 is the negative coefficient associated with Internet instruction. With ability, effort, and demographic considerations constant, students enrolled in the Internet course scored over 4% lower on the comprehensive final exam than did students in the other course modes. The 4% quality differential is not surprising because the online mode is relatively new. It is reasonable to expect the quality gap between the campus and online instruction modes to narrow over time as faculty gain experience in the digital environment and as technological advances (e.g., blog, podcast, streaming video) improve mode efficiency.

Support for the diminishing learning gap between campus and online instruction is given credence by the positive and statistically significant coefficient on the NET*TIME variable. Despite the fact that the passage of time (measured by TIME) does not have a significant impact on final exam scores for the data set as a whole, there is strong evidence that student performance in online classes is improving over time at a rate close to 1% per year.

The coefficient corresponding to the hybrid mode reveals that student scores on the final exam are not significantly different from the campus alternative. The student performance results verify the grade distribution assessment results of the previous section because the campus and hybrid modes are approximately the same but significantly higher than the online instruction mode. The results imply that using online tools and communication, in the form of a hybrid

TABLE 2. Estimation of Equation 8, Which Measures Effectiveness of Student Performance

Variable	Coefficient	*t*(811)
Intercept	–42.475	–1.31
ABILITY	0.048	3.92*
HW	0.826	6.38*
NET	–4.031	–2.32*
HYBRID	0.383	0.29
FOREIGN	1.771	1.54
MAJOR	5.814	4.64*
TIME	0.067	0.58
NET*TIME	0.891	2.46*

Note. $R^2 = .6222$, $F(1, 811) = 103.82$, $*p < .05$, and $n = 820$.

class, can substitute some classroom contact time normally associated with campus courses without compromising the overall quality of student learning.

The stability of the model's other coefficients suggests that the model is somewhat robust. Ability, as measured by the admission GMAT and GPA composite score, has a positive and significant impact on final exam performance. The variable MAJOR is also positive and statistically significant, implying that students with an academic background in a specific discipline perform at a higher level than others do. The coefficient associated with MAJOR is relatively large, implying a 5.8% increase on final exam performance. Student effort as measured by percentage score on homework assignments yields a positive and significant coefficient. The effort variable does not accurately measure the amount of time that a student applied to the course because productivity is different across students. The effort variable is a proxy for willingness to work until complete and adequate homework answers are obtained, organized, and presented to the course instructor. Certainly, ability and effort should be positively related to final exam performance in a random sample of college courses. The demographic variable controlling for foreign student performance is positive, with a coefficient of 1.77, but not statistically significant. Hence, foreign versus domestic student classification is not a significant determinant of student performance on final exam for this study cohort.

Conclusions and Implications

In this study, I compared online, campus, and hybrid modes of instruction. The research results indicate that the pure form of online instruction is the least effective of the three. Specifically, student grades, retention results, and course evaluations are lower for the online mode of instruction compared with the campus and hybrid alternatives. Direct assessment results with control for student ability, effort, and demographic characteristics indicate that students perform significantly lower on a comprehensive final exam when completing an online course versus the campus or hybrid alternatives. The results should not be viewed as an indictment of online instruction because the format is still in the initial stage of development. The empirical results provide evidence that the gap in student performance between online and campus courses is narrowing and will continue to narrow as new technology and faculty sophistication in the environment improve over time. Direct assessment results derived from student assignments focusing on business applications or team building is equivalent across the three modes of instruction. For institutions and faculty not willing to fully commit to the online mode at this point, the hybrid mode is a viable alternative that offers some flexibility but maintains the high quality and student satisfaction associated with traditional campus instruction.

NOTE

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