A Study In Analyzing Effectiveness Of Undergraduate Course Delivery: Classroom, Online And Video Conference From A Student And Faculty Perspective

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ABSTRACT

Higher education students can and do take courses delivered in a variety of ways. But, to date, little research has been done on the effectiveness of different delivery modes. This study sought to fill that void by comparing the effectiveness of three undergraduate course delivery modes: classroom, online, and video conference at a technical institute in a mid-Atlantic state. Students (N = 1,206) and faculty (N = 160) completed questionnaires on effectiveness, in terms of satisfaction, for each mode. The questionnaire response rates were 74% for students and 86% for faculty. In terms of student satisfaction, the results revealed that classroom delivery was more effective than technologically delivery with online being slightly more effective than video conference. The same results were found for faculty satisfaction. The results of this research should assist leaders in higher education to understand the benefits associated with different undergraduate course delivery modes. In addition, by developing and testing a framework that can be used for estimating effectiveness of different delivery methods, the study provides leaders with a useful tool for securing and applying this type of information when making decisions about the modes best suited to serve their academic communities.

Keywords: Distance education, Effectiveness, Online, Video conference, Classroom, Delivery modes, Student participation, Faculty participation, Cognitive skills, Learning styles, Education utilization.

I. INTRODUCTION

Use of distance education technology is growing at a rapid pace in higher education. In 1995, the U.S. Department of Education reported that of institutions of higher learning, two-year, four-year and graduate, 33% offered distance education courses and almost 25% had degree programs that students could complete entirely online (Merisotis, 1999). Eduventures (2005), a research and consulting company, reported, that fewer than 500,000 students took online courses in 2002, but three years later, by fall 2005, over 3.2 million students were taking at least one online course. Online enrollments are growing and institutions of higher education continue to report record increases in online enrollment (Allen & Seaman, 2006).

Currently, two types of technology support most distance education courses: online delivery and video conference delivery. Online delivery involves student/instructor and student/content interactions asynchronously or synchronously through the Internet. *Engineering Outreach* (2002) defined telecommunications distance education as "two way electronic communication between two or more groups in separate locations via audio, video, and/or computer systems" (p. 2). Video conference course delivery involves student/instructor and student/content interactions synchronously, but not necessarily in the same location. During a course period, the students and teacher may be communicating via an interactive two-way audio/video system. The student and instructor can see and hear each other instantaneously using monitors.

Distance education provides students in higher education the opportunity to take courses utilizing various delivery modes, many of which are technology based. As a result, distance education is enjoying a renaissance of sorts. The strong emergence and popularity of technological distance education have required greater resources requirements and have resulted in higher expectations and greater scrutiny. If distance education programs are going to continue to grow and to compete with traditional classroom delivery, they must demonstrate performance results (Prestera, 2001).

The growth in distance education can be attributed to a number of explanations. College administrators and public officials cite various reasons for the expansion of distance education: public funds being reduced for higher education, projected growth in enrollments, and providing access to students who find it difficult to attend traditional institutions or who may be physically unable to do so (Kriger, 2001).

An example of the recognition of potential growth in distance education was made by the community college system in California. The Educational Services and Economic Development Division for California Community College (ESEDD) developed and implemented a broad range of distance education offerings, both courses and services. This was done with assistance from various faculty and college consortia and met the aspirations for faculty instruction and student learning; as a result, these distance education efforts have continued to evolve and grow (ESEDD, 2001).

Though there are many possible benefits to instituting distance education delivery modes within institutions of higher education, there are some who are concerned with the quality of education offered at a distance. Rovai and Barnum (2003) suggested that distance education can diminishes the quality of higher education. Faculty members are concerned with distance learning, primarily about the effect it will have on their role in instruction (Valentine, 2002).

A major concern is that technology will destroy the close relationship that faculty have with their students within the traditional classroom setting. Valentine suggested that the challenges of distance learning instruction fall into various categories with quality of instruction, hidden costs, and the attitudes of faculty, students, and administrators being the three most prevalent. Research has indicated that distance education courses can be impersonal, dehumanizing, and possibly detracting from the interactions between the faculty and students (Nissenbaum & Walker, 1998; Phipps & Merisotis, 1999; Trinkle, 1999).

It is the responsibility of faculty to provide quality learning experiences for students. It is especially important for distance education faculty to provide quality learning experiences, because historically this form of education has been judged to be less capable of meeting traditional educational standards (McDonald, 2002).

Some argue that there may be opportunities and advantages for students and faculty within the distance education environment that may not be available within a traditional style classroom. Baird (1992) contended that distance education can be a frontier for new methods of teaching, learning, and communicating that may not be possible in traditional classrooms.

Nonetheless, higher education faculty members are among the harshest critics of distance education (Phipps & Merisotis, 1999). Maloney (1999) suggested that much of the writing surrounding the rise of distance learning education make faculty members uneasy. Faculty members have many questions concerning distance education, ranging from the pedagogical to the financial. Disturbing to some faculty members is that they see college administrators excited about the potential financial rewards of new student markets being tapped through distance education. Feenberg (1999) asserted that faculty members are not leading the movement to initiate distance education at institutions of higher education. Instead, politicians, university administrations, and computer and telecommunications company personnel have been in the forefront of promoting and instituting distance education ventures, because these individuals see the potential in some cases for large financial gains.

With so much at stake with the future of distance education in higher education, faculty, administrators, and policy makers need to make informed decisions about the increasingly aggressive distance education initiatives.

Research Site. The site institution for this study has a long history of using all three methods of course delivery. The institution has been teaching classroom-based courses for 50 years, has used video conference-based course delivery for 9 years, and has used online-based course delivery for 5 years. This institution was selected because the students have the option of choosing the type of delivery mode they prefer and many students have experienced blended learning by availing themselves of more than one delivery mode. Additionally, the site was selected because the institution was convenient for the researcher and because the institution was willing to participate in the study. The selected institution agreed to support the study and granted permission to collect information from students.

Effectiveness in Terms of Satisfaction. Based on the National Education Association's *Benchmarks for Success in Internet-Based Distance Education* (2000), the American Federation of Teachers *Guidelines for General Practice* (2000), and the American Distance Education Consortium's *Guiding Principles for Distance Teaching and Learning* (2003), effectiveness in terms of satisfaction was assessed from two perspectives: the students and the faculty. Satisfaction was judged by using a series of questionnaire items to determine how well the technology, the infrastructure, the course content, and instructional inter-activeness matched student and faculty needs.

The measures of effectiveness were developed by drawing upon factors derived from previous developed lists of crucial elements. For the selection of the factors to be used in this study, each factor included had to appear on at least two of the lists of effectiveness devised by the National Education Association (2000), the American Federation of Teachers (2000), and the American Distance Education Consortium (2003). Using the decision rule of at least two appearances, nine factors were identified as measures of satisfaction and, thus, by definition measures of effectiveness. These nine items were applied to the three undergraduate course delivery modes: classroom, online and video conference to assess satisfaction.

Factors Related to Effectiveness of Course Delivery Modes

1. Class size density
2. Utilization of educational resources
3. Enhancement and application of cognitive skills
4. Promotion of active participation by students
5. Interaction of instructor and students within learning environment
6. Allowance for student group collaboration
7. Recognition of different learning styles
8. Accommodation of diversity and multiculturalism
9. Effectiveness for learning course content.

Effectiveness

This study surveyed both undergraduate students and faculty in fall 2006 to secure a measure of satisfaction with each delivery mode. The student questionnaire was distributed to students taking classroom courses (n = 596), students taking online courses (n = 500), and students taking video conference courses (n = 109). The faculty questionnaire was distributed to those faculty teaching classroom courses (n = 90), faculty teaching online courses (n = 47), faculty teaching video conference courses (n = 23).

The students (N = 1,205) and faculty (N = 160), to whom the questionnaires were distributed, were selected by classes from those taking courses and those teaching courses in five areas: accounting, business management, hospitality management, behavioral science, and English. The areas were selected for the study, because courses offered in all these areas were available in each of the three modes.

Data Collection for Effectiveness

To collect information on effectiveness, short questionnaires were tailored for students and faculty for each of the three delivery mode for a total of six versions, which posed essentially the same questions. Of the items on the questionnaire, nine were based on the factors indicating satisfaction taken from the lists developed by national organizations. These items required responses that ranged from *Strongly disagree* to *Strongly agree* on a four-point

Likert-type scale. Two items asked for comparisons between delivery mode pairs. Three items asked for information concerning familiarity, in terms of number of courses taken, with each delivery mode. An open-ended question completed the questionnaire, so respondents, desiring to do so, could express their opinions on different course delivery modes or on other issues.

Data Analysis

The data collected for the research question on effectiveness were compiled from the questionnaires that were completed by both students and faculty for the three delivery modes. Each questionnaire measured effectiveness on nine factors in terms of satisfaction with class size density, utilization of educational resources, enhancement and application of cognitive skills, promotion of active participation by students, interaction of instructor and students within learning environment, allowance for student group collaboration, recognition of different learning styles, accommodation for diversity and multiculturalism, effectiveness for learning course content. These factors were supported by literature, which suggested their importance and relevance to the educational learning environment.

For each effectiveness item, respondents had the choice of one of four responses: strongly disagree, disagree, agree, and strongly agree. Strongly agree signified highly effective, whereas strongly disagree signified highly ineffective. Numerically, the responses were assigned values ranging from a low of "1" for strongly disagree to a high of "4" for strongly agree. The responses were tabulated for each item for students and faculty, and by each delivery mode: classroom, online, and video conference. Total effectiveness was calculated as the sum of the scores on the individual items and the means and standard deviations were calculated for each respondent group and for each delivery mode.

The original plan was to use Analyses of variance (ANOVAs) to test for differences on the total effectiveness by group (students and faculty) and by delivery mode (classroom, online, and video conference). Assumptions crucial to use of ANOVAs, normality and homogeneity of variance, were assessed; not all of these tests were met. As a result, *t*-tests were used to make the comparisons. All items on the questionnaire were weighted equally.

II. FINDINGS

1. Demographics

a. Faculty Titles. The only demographic characteristic collected from faculty was faculty rank. The faculty titles used on the questionnaires were the traditional ones: Full Professor, Associate Professor, Assistant Professor, and Instructor. The percentage of faculty by title participating in the study was fairly evenly distributed. Associate professors were the largest represented group and accounted for one-third of the responses and the instructors were the smallest group. Table 1 presents the distribution of participating faculty members by title.

Table 1
Distribution of Faculty by Title in Frequency and Percent

Instructors Title	Frequency	Percent
Full Professor	33	23.9
Associate Professor	45	32.6
Assistant Professor	37	26.8
Instructor	23	16.7

b. Student Year. Frequencies and percentages for responding students by year are presented in Table 2. The respondents represented a good balance from each year: freshman, sophomore, junior, and senior, but the respondents were weighed more heavily towards the upper-division classes than the distribution of undergraduates within the institution.

Table 2
Distribution of Students by Year in Frequency and Percent

Year	Frequency	Percent
Freshman	237	27.8
Sophomore	140	16.4
Junior	181	21.2
Senior	294	34.5

c. Student Academic Major. The choice of academic majors of the responding students, in terms of frequencies and percentages, is presented in Table 3. The greatest number of the students, about two-thirds, selected Other as their major. Hospitality Management was the next most frequent major.

Table 3
Distribution of Students by Major in Frequency and Percent

Major	Frequency	Percent
Accounting	22	2.5
Business Administration	70	7.9
Hospitality Management	148	16.7
Behavioral Science	46	5.2
English	15	1.7
Other	584	66.0

Full-Time Status of Students. Among the students responding, 769 were enrolled full-time (87%) and 119 were enrolled part- time (13%) This compared with a total undergraduate student body in which 6,177 students enrolled full-time (75%) and 2,048 students enrolled part-time (25%).

2. Response Rates for Questionnaires

a. Faculty Questionnaire. For two delivery modes, classroom and video-conference, the return rates were 100% for the faculty questionnaires. For these modes, the questionnaires were distributed and collected in the classroom. The online mode had a lower return rate of 53%. Table 4 presents the results. The overall return rate for faculty questionnaires was 86%.

Table 4
Response Rates for Faculty Questionnaires

Delivery Mode	Number Requested	Number of Responses	Percent
Classroom	90	90	100%
Online	47	25	53%
Video Conference	23	23	100%
Total	160	138	86%

b. Student Questionnaires. For two delivery modes, classroom and video-conference, the return rates were 100% for the student questionnaires. For these modes, the questionnaires were distributed and collected in the classroom. The online mode had a lower return rate. These return rates by mode are presented in Table 5. The overall return rate for the student questionnaires was 74%.

Table 5
Response Rates for Student Questionnaires

Delivery Mode	Number Requested	Number of Responses	Percent
Classroom	597	597	100%
Online	500	182	36%
Video Conference	109	109	100%
Total	1,206	888	74%

c. Effectiveness of Three Delivery Modes In order to determine effectiveness in terms of satisfaction with the three delivery modes, classroom, online, and video conference, short questionnaires for each mode were tailored to students and faculty. The resulting student data did not meet all the requirements for using the ANOVA test to compare the results, particularly the equal variance requirement, though the faculty data did. However, in order to produce comparable results for both student effectiveness and faculty effectiveness, the decision was made to use *t*-tests for the analyses of both.

d. For both students and faculty, 10 independent sample *t*-tests were conducted to examine if mean differences existed on the nine effectiveness measures (class size, education utilization, cognitive skills, student participation, interaction, collaboration, learning styles, diversity, and effective delivery) and on total effectiveness by mode (classroom vs. online; classroom vs. video conference, and online vs. video conference).

Each questionnaire ended with this invitation to the participating students and faculty: *Any general or additional comments pertaining to [classroom or online or video conference] courses are welcome.* Results from this open-ended question are summarized at the end of this section.

e. Faculty Effectiveness of Three Delivery Modes. The means and standard deviations for each of the faculty effectiveness measures by mode are reported in Table 6.

Table 6: Means and Standard Deviations for Faculty Effectiveness by Mode: Classroom, Online, and Video Conference

	Classroom		Online		Video Conference	
	M	**SD**	**M**	**SD**	**M**	**SD**
Class Size	2.82	0.89	2.04	0.91	2.05	0.79
Education Utilization	3.13	0.77	2.96	0.75	2.86	0.83
Cognitive Skills	3.42	0.63	2.92	0.88	2.59	0.67
Student Participation	3.52	0.62	2.79	1.14	2.41	0.73
Instructor Interaction	3.70	0.49	2.92	0.83	2.27	0.83
Student Collaboration	3.38	0.61	2.71	0.69	2.29	0.90
Learning Style	3.20	0.68	2.88	0.68	2.68	0.72
Diversity	3.44	0.62	2.63	1.01	2.77	0.87
Effective Delivery	3.56	0.52	3.04	0.69	2.77	0.53
Total Effectiveness	3.35	0.45	2.76	0.60	2.52	0.54

Even though the Levene's tests of equal variances were not significant, unequal error variance *t*-tests were used to make comparisons, rather than using ANOVA tests, in order to achieve comparability with the student effectiveness comparisons, - which was part of another portion of this study which will be utilized to make comparison between student and faculty effectiveness. The results for an independent sample *t*-test on faculty effectiveness comparing classroom vs. online are presented in Table 8, for classroom vs. video conference in Table 10, and for online vs. video conference in Table 12. Each table is followed by a discussion of the significant findings.

f. Student Effectiveness of Three Delivery Modes

The means and standard deviations for each of the student effectiveness measures by mode are reported in Table 7.

In making the comparisons, Levene's tests of equal variances were significant, thus unequal error variance *t*-tests were used on the specified variables. The results for an independent sample *t*-test on student effectiveness comparing classroom vs. online modes are presented in Table 9, for classroom vs. video conference in Table 11, and for online vs. video conference in Table 13. Each table is followed by a discussion of the significant findings.

Table 7: Means and Standard Deviations for Student Effectiveness by Mode: Classroom, Online, and Video Conference

	Classroom		Online		Video Conference	
	M	**SD**	**M**	**SD**	**M**	**SD**
Class Size	2.90	0.74	3.21	0.79	2.74	0.79
Education Utilization	3.13	0.67	2.84	0.82	2.70	0.81
Cognitive Skills	3.21	0.60	2.90	0.81	2.78	0.75
Student Participation	3.34	0.67	2.82	0.93	2.65	0.81
Instructor Interaction	3.43	0.63	2.65	0.89	2.57	0.83
Student Collaboration	3.28	0.66	2.51	0.94	2.58	0.80
Learning Style	3.03	0.66	2.81	0.78	2.80	0.74
Diversity	3.22	0.64	2.81	0.91	2.84	0.75
Effective Delivery	3.25	0.58	2.79	0.87	2.67	0.76
Total Effectiveness	3.20	0.43	2.81	0.65	2.71	0.56

Table 8: *T*-Tests for Faculty Effectiveness by Mode: Classroom vs. Online

Effectiveness Measures	*t*	df	Sig.
Class Size	3.78	114	.000
Education Utilization	0.98	114	.331
Cognitive Skills	3.21	114	.002
Student Participation	3.02	27	.006
Instructor Interaction	4.41	27	.000
Student Collaboration	4.69	114	.000
Learning Style	2.05	114	.043
Diversity	3.76	28	.001
Effective Delivery	3.99	112	.000
Total Effectiveness	5.31	111	.000

Note. Because a total of nine *t*-tests were run, the alpha level of .05 was adjusted to .01.

The results of the analysis in Table 8 revealed that significant differences existed on all the effectiveness measures, according to faculty, between classroom and online delivery, except two: education utilization and learning styles. Except for these two measures, faculty members using classroom delivery were significantly more satisfied than were faculty using online delivery.

Table 9: *T*-Tests for Student Effectiveness by Mode: Classroom vs. Online

Effectiveness Measures	*t*	df	Sig.
Class Size	-4.68	286	.000
Education Utilization	4.37	260	.000
Cognitive Skills	4.68	243	.000
Student Participation	6.91	241	.000
Instructor Interaction	10.98	237	.000
Student Collaboration	10.27	239	.000
Learning Style	3.46	264	.001
Diversity	5.61	239	.000
Effective Delivery	6.81	233	.000
Total Effectiveness	7.36	223	.000

Note. Because a total of nine *t*-tests were run, the alpha level of .05 was adjusted to .01.

The results of the analysis, presented in Table 9, revealed significant differences on all the effectiveness measures between classroom and online delivery with students expressing greater satisfaction on all measures. However, on class size, the mean for classroom students was significantly smaller, which suggested that classroom delivery (M = 2.90) did not work as well for students as online delivery (M = 3.21) in accommodating any number of students. On all other measures, classroom students were significantly more favorably disposed than online students.

Table 10: *T*-Tests for Faculty Effectiveness by Mode: Classroom vs. Video Conference

Effectiveness Measures	*t*	df	Sig.
Class Size	3.73	112	.000
Education Utilization	1.43	112	.155
Cognitive Skills	5.49	112	.000
Student Participation	7.29	112	.000
Instructor Interaction	7.76	25	.000
Student Collaboration	5.29	24	.000
Learning Style	3.14	112	.002
Diversity	4.17	111	.000
Effective Delivery	6.24	32	.000
Total Effectiveness	7.36	108	.000

Note. Because a total of nine *t*-tests were run, the alpha level of .05 was adjusted to .01.

The results of the analysis, presented in Table 10, for classroom and video conference modes, revealed a similar pattern as the one for the classroom and online modes. For the faculty, there were significant differences on all effectiveness measures, except one: education utilization. This indicated that the classroom faculty rated various aspects and total effectiveness of classroom delivery higher than did the video conference faculty for video conference delivery.

Table 11: *T*-Tests for Student Effectiveness by Mode: Classroom vs. Video Conference

Effective Measures	*t*	df	Sig.
Class Size	2.03	703	.043
Education Utilization	5.26	136	.000
Cognitive Skills	5.62	134	.000
Student Participation	8.31	135	.000
Instructor Interaction	10.32	132	.000
Student Collaboration	8.64	137	.000
Learning Style	3.09	141	.002
Diversity	5.42	699	.000
Effective Delivery	7.63	132	.000
Total Effectiveness	8.49	131	.000

Note. Because a total of nine *t*-tests were run, the alpha level of .05 was adjusted to .01.

The results of the analysis, presented in Table 11, revealed significant differences on all effectiveness measures, reported by students between classroom delivery and video conference delivery, except one. This indicated that the classroom students rated various effectiveness aspects of their courses higher than did the video conference students. However, on class size the difference was not significant, even though students found classroom delivery (M = 2.90) slightly more accommodating to any number of students than did students in the video conference delivery mode (M = 2.74).

Table 12: *T*-Tests for Faculty Effectiveness by Mode: Online vs. Video Conference

Effectiveness Measures	*t*	df	Sig.
Class Size	-.02	44	.988
Education Utilization	.41	44	.687
Cognitive Skills	1.41	44	.167
Student Participation	1.34	44	.188
Instructor Interaction	2.63	44	.012
Student Collaboration	1.78	43	.083
Learning Style	.94	44	.353
Diversity	-.53	44	.600
Effective Delivery	1.47	44	.148
Total Effectiveness	1.40	43	.168

Note. Because a total of nine *t*-tests were run, the alpha level of .05 was adjusted to .01.

The results of the analysis, presented in Table 12, showed only one almost significant difference on the effectiveness measures, according to faculty, between online courses and video conference courses. The difference suggested that interaction between students and instructor was better, but not significantly, in the online mode, as compared to the video conference mode.

Table 13: *T*-Tests for Student Effectiveness by Mode: Online vs. Video Conference

Effectiveness Measures	*t*	df	Sig.
Class Size	4.89	289	.000
Education Utilization	1.46	289	.147
Cognitive Skills	1.27	289	.207
Student Participation	1.63	288	.104
Instructor Interaction	0.79	288	.431
Student Collaboration	-0.65	256	.517
Learning Style	0.15	288	.880
Diversity	-0.34	260	.733
Effective Delivery	1.16	289	.249
Total Effectiveness	1.29	280	.198

Note. Because a total of nine *t*-tests were run, the alpha level of .05 was adjusted to .01.

The results of the analysis, presented in Table 13, revealed only one significant difference between the effectiveness of online and video conference deliver, as determined by students. This suggested in the opinion of students that video conference delivery was less adaptable to accommodating any number of students than was the online delivery. Otherwise, no significant differences on effectiveness were found between these two distance education delivery modes.

Comments on Delivery Modes

Faculty Comments on Classroom Delivery. Many of the positive threads of thoughts from the faculty are summarized in a statement made by one faculty member, "Preparation of students for a profession requires a good deal of classroom and lab experiences to assure protection of consumers of our services. I would not want to have a physician who got the MD or DO degree online!" In the classroom, understanding body language can help an instructor assess the students and change instructional delivery to improve student comprehension, which is more difficult to do with online or video modalities. Instructors also stated that classroom delivery allowed them to provide better support and empathic listening to students. A physical presence greatly supports understandings about learning in that learning must be emotionally "right" for students before it can be cognitively "right" for them.

Classroom delivery provided more assurance that student were doing their own work, rather than someone else's. Overall, the human interaction element makes classroom delivery preferable. One example was given by a professor, who stated, "I teach an architectural design studio, where one-to-one interaction and peer review are critical components of the process."

Student Comments on Classroom Delivery. A positive common theme among the students taking classroom courses was that classroom delivery allowed students to concentrate on and to understand the material and that greater interaction occurred between the students and the instructor. Classroom delivery allowed students to "stand up" and demonstrate physical actions and presentations, more easily than either online or video conference deliveries could permit. Classroom delivery was more accommodating for international students, who needed more help because of language differences. Through interactions in the classroom, instructors could get a better understanding of their students and how to address students' individual needs. A majority of the students expressed the opinion that face-to-face conventional classroom courses were by far the best way to learn.

Some common negative thoughts, expressed by students, were that some instructors promoted classroom discussion and participation, while others did not want anyone to speak or to ask questions until told to do so.

Faculty Comments on Online Delivery. Many faculty teaching by online delivery found this mode, in the words of one, "a wonderful way to ensure organized content, as well as learning objectives." In particular, online delivery requires all students to actively participate, and provides the instructor with an opportunity to utilize a wide variety of learning materials.

Many of the negative thoughts from the faculty teaching online revolved around the fact that they found some material harder to teach online, for example quantitative subjects, such as mathematics. Students who were unfamiliar with quantitative material really needed contact with the instructor so they could follow the work at the board. Online delivery often was very impersonal with little or no interaction between the instructor and the students. Online delivery allowed the good students to learn more, but average or poor students learned a lot less. In addition, the success of the course was largely dependent on the capabilities and efforts of the instructor.

Student Comments on Online Delivery. A positive common thought shared by many students about online delivery was the flexibility of fulfilling the course work around personal time schedules. Many students noted that online delivery accommodated various work hours, as well as family commitments and obligations, and overcame the difficulty of having to come physically to class. In addition, some students commented that they enjoyed online delivery because it provided an opportunity to participate more than they would have in a classroom. Online delivery also provided an opportunity for students to learn at their individual rates. However, a large number of students noted the success of the online delivery largely depended upon the instructor; some instructors were very active, where others were not.

One common negative reaction from students was that they found the institutional policy requiring a minimum of 2.5 GPA for students to take online courses unfair, especially because this requirement did not apply to those taking classroom or video conference courses. Student also noted the concern that other online students find ways to cheat on examinations more easily than students in classroom or video conference courses. One student said, "How does an instructor know who is taking the exam, and if more than one student are together when they are doing the exam."

Additional concerns from online students were that the online course itself can be confusing in the way it is set up for students, because many instructors arranged their course sites quite differently. Lack of personal contact with the instructor was another concern voiced by online students. The online mode was seen as very impersonal. At times there was little or no communication between the instructor and the students, leaving students feeling alienated and isolated.

Faculty Comments on Video Conference Delivery. Many video conference faculty members expressed the opinion that video conference delivery can be effective for delivering course content in some fields, but not in all.

One negative thread from the video conference faculty was the "time element" with regard to instructional time lost due to malfunctioning of the technology being used. Some instructors noted that they "struggled through classes getting almost nothing accomplished because of difficulties with the various equipment and technology."

A large number of instructors noted that they enjoyed face-to-face interaction with students and that they considered student-to-student interactions very important. This was especially true of students who need and appreciate person attention. Establishing personal contact can be done with video conference delivery, but is more difficulty to accomplish than with traditional classroom delivery.

A small portion of faculty noted that traditional lecture halls outfitted with hundreds of non-moveable seats were clearly not useful for the video conference mode. Rooms that are not properly equipped with audio-visual technologies, such as data projectors or Internet connection, make teaching difficult, particularly for someone who uses a great number of images for presentation. Some video conference instructors suggested that "success and effectiveness entirely relies on the skills of the professor."

Student Comments on Video Conference Delivery. A common positive reaction among the students using video conference delivery was that it saved commuting time. Also, the video conference mode provided students with real world experience of teleconferencing, which is used in the business world. Many students also commented that if the instructor was very good at communicating and keeping the students involved in the subject matter, the class was equally as engaging as traditional classroom delivery.

A common negative reaction among many video conference students was that instructors often had difficulty operating the technology and getting the initial set-up of the class started on time. Other negative comments pertained to difficulties in hearing the instructor, poor visibility for students, and lack of clarity of faculty on screen. Additionally, many students did not like the idea of seeing themselves on large monitors viewed at other campus sites. Video conference students noted that they did not like having an instructor teaching from afar, and not being in the same classroom with them. Students stated that video conference delivery lacked the type of interaction with the instructor and other students that was possible in the traditional classroom

III. SUMMARY

Faculty Effectiveness. For faculty, the findings showed significant differences existed on all the effectiveness measures between classroom and online delivery, except for education utilization and learning styles. Though education utilization and addressing a variety of learning styles were favored more in the classroom than online, the differences were not significant. Based on total effectiveness, the finding was significant that classroom delivery was more effective than online delivery in the opinion of faculty members.

For faculty, the results of comparing the classroom mode with the video conference mode on the effectiveness measures revealed significant differences on all effectiveness measures, except for one, education utilization. Thus, these results were similar to those comparing classroom to online. Based on total effectiveness, the finding was significant that classroom delivery was more effective than video delivery in the opinion of faculty members.

For faculty, the results of comparing the online mode and the video conference mode on the effectiveness measures were not as compelling. All measures of effectiveness were not significantly different, except for one measure, faculty interaction. Faculty suggested that interaction among faculty and students was better for online delivery, as opposed to a video conference delivery. Besides the one significant difference of faculty interaction, no significant differences on effectiveness were found when comparing the two distance delivery modes.

Student Effectiveness. For students, the findings showed significant differences existed on all the effectiveness measures between classroom and online delivery. Students in the classroom mode expressed greater satisfaction on all measures, except class size. On all other measures, the students were significantly more favorably disposed toward classroom delivery, than the online delivery. Based on total effectiveness, the finding was significant that for students classroom delivery was more effective than online delivery.

For students, the results of comparing the classroom mode with the video conference mode on the effectiveness measures revealed significant differences on all effectiveness measures. Based on total effectiveness, the finding was significant that for students classroom delivery was more effective than video conference delivery.

For students, the results of comparing the online mode and the video conference mode on the effectiveness measures were less revealing. The only significant difference between the two was on class size. This suggested that in the opinion of students, the video conference mode was less adaptable to accommodating any number of students, than was the online mode. Otherwise, no significant differences on effectiveness were found between the two distance delivery modes investigated.

IV. CONCLUSIONS

From these findings, the major conclusion reached was that classroom delivery was more effective than the two distance education modes investigated, - online and video conference. Not only were there differences between

the classroom and distance modes but, where measurable, these differences were significantly weighted in favor of the classroom delivery. However, no significant differences were found between the two distance education delivery modes.

The results should also be useful to leaders at other institutions of higher education. By applying the framework, developed for this study, to determining the effectiveness of the course delivery modes at their colleges and universities, institutional leaders can better understand the benefits and challenges associated with different undergraduate delivery modes. Prior to making decisions about the course delivery modes best suited to their institutions, leaders should request and apply effectiveness information. Once secured, this information will help leaders to make more informed decisions.

AUTHOR INFORMATION

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REFERENCES

1. Allen, I. E., & Seaman, S. (2006). *Making the grade: Online education in the United States, 2005.* Cambridge, MA: Alfred P. Sloan Foundation.
2. American Distance Education Consortium. (2003*). Guiding principles for distance teaching and learning.* Washington, DC: Author.
3. American Federation of Teachers. (2000). *Distance education: Guidelines for general practice.* Washington, DC: Author.
4. Baird, M. A., & Monson, M. K. (1992). Distance education: Meeting diverse learners' needs in a changing world. *New Directions for Teaching and Learning, 51,* 65-75.
5. Daniel, J. S. (1999). *Mega-universities and knowledge media*. London: Kogan Page.
6. Educational Services and Economic Development Division for California Community College's. (2001). *Distance education report*. Sacramento, CA: Chancellor's Office, California Community Colleges.
7. *Engineering Outreach*. (2002). Distance education at a glance. Retrieved December 4, 2002, from http://www.uidaho.edu/eo/dist.html
8. Feenberg, A. (1999). No frills in the virtual classroom. *Academe, 85*(5). 26-31.
9. Institute of Higher Education Policy. (2000). *Benchmarks for success in Internet-based distance education: Quality on the line*. Washington, DC: National Education Association.
10. Kriger, T. (2001). A virtual revolution: Trends in the expansion of distance education. *United States Distance Learning Journal*, 15, 11.
11. Levin, H. M., & McEwan, J. P. (2001). *Cost-effectiveness analysis* (2nd ed.). London: Sage.
12. Maloney, W.A. (1999). Brick and mortar: Campuses go online. *Academe, 85*(5), 18-24.
13. McDonald, J. (2002). Is "As good as face-to-face" as good as it gets? *Journal of Asynchronous Learning Networks*. Retrieved January 13, 2000, from http://www.aln.org/publications/jaln/v6n2/v6n2_macdonald.asp
14. Merisotis, J. P. (1999). The "what's the difference?" debate. *Academe,* 5(5), 47-51.
15. National Education Association. (2000). *A survey of traditional and distance learning higher education members of the National Education Association*. Retrieved January 13, 2007, from http://www.nea.org/he/aboutthe/distance.htm
16. National Education Association. (2000). *Benchmarks for success in Internet-based distance education.* Washington, DC: Author.

17. Nissenbaum, H., & Walker, D. (1998). A grounded approach to social and ethical concerns about technology and education. *Journal of Educational Computing Research, 19*(4), 411-431.
18. Phipps, R., & Merisotis, J. (1999).*What's the difference? A review of contemporary research on the effectiveness of distance learning in higher education*. Washington, DC: The Institute for Higher Education Policy.
19. Prestera, G. E. (2001). Organizational alignment supporting distance education in post-secondary institutions. *Online Journal of Distance Learning Administration*. Retrieved December 4, 2005, from http://www.westga.edu/~distance/ojdla/winter44/prestera44.html
20. Rovai, A. P., & Barnum, K. T. (2003). Online course effectiveness: An analysis of student interactions and perceptions of learning. *Journal of Distance Education, 18*, 57-73.
21. Trinkle, D. A. (1999). Distance education: A means to an end, no more, no less. *The Chronicle of Higher Education, 45*(48), 1.
22. Valentine, D. (2002). Distance learning: Promises, problems, and possibilities. *Online Journal of Distance Learning Administration, 5*(3). 1-11.

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