Faculty Satisfaction With Distance Education: A Comparative Analysis On Effectiveness Of Undergraduate Course Delivery Modes

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ABSTRACT

Higher education faculty can and do teach 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. Faculty (N = 160) completed questionnaires on effectiveness, in terms of satisfaction, for each mode. The questionnaire response rates were 86% for faculty. In terms of faculty satisfaction, the results revealed that classroom delivery was more effective than technologically delivery with online being slightly more effective than video conference. The results of this research should assist leaders in higher education to understand the benefits associated with different undergraduate course delivery modes. In addition, 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, Diversity, Student participation, Faculty participation, Cognitive skills, Learning styles, Education utilization.

I. INTRODUCTION

In colleges and universities, faculty are increasingly utilizing a variety of modes of instructional delivery to assist in teaching their courses. Distance education has enjoyed renewed popularity with the advent of technological delivery through two main forms: online and video conference. However, if institutions of higher education invest in distance education using online and/or video conference delivery but do not assess the effectiveness of these approaches, the end result could be fiscally and academically detrimental.

To address the issue of determining the effectiveness of different instructional delivery methods, this study compared three modes for undergraduate education: classroom, online, and video conference. The methodology used for this study was an effectiveness analysis, which refers to the evaluation of alternatives according to their effects. Effectiveness was measured against a set of established criteria, from those recommended by the National Education Association (2000), the American Federation of Teachers (2000), and the American Distance Education Consortium (2003), in terms of satisfaction with the course delivery mode. The data were collected from one institution of higher education, a technical institute in a mid-Atlantic state, which had a long history of using all three delivery modes.

The role of distance education in the renewal of the wider university enterprise should depend on the effectiveness of present and future technologies. With the continuing shortage of funds to support higher education, institutions must not only maintain but enhance their effectiveness, if they are to provide an attractive, sustainable instructional model (Daniel, 1999). The findings of this study can be used to assist institutional leaders in developing ways to assess and compare cost-effectiveness of classroom delivery with technology-based delivery.

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 faculty has the option of choosing the type of delivery mode they prefer to teach in and many faculty have experienced blended teaching and learning methods 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 faculty members willing to participate.

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 the faculty perspectives. 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 faculty in fall 2006 to secure a measure of satisfaction with each delivery mode. 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 faculty ($N = 160$), to whom the questionnaires were distributed, were selected by classes from 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 faculty for each of the three delivery mode for a total of three 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 second research question on effectiveness were compiled from the questionnaires that were completed by 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 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 (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

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

2. Response Rates for Questionnaire

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 2 presents the results. The overall return rate for faculty questionnaires was 86%.

Table 2: 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%

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 faculty. The resulting data did not meet all the requirements for using the ANOVA test to compare the results of a larger portion of this study (which had included student effectiveness), particularly the equal variance requirement, - though the faculty data did. However, in order to produce comparable results (for both student effectiveness and faculty effectiveness for future comparisons) the decision was made to use *t*-tests for the analyses of both.

For 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 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.

Faculty Effectiveness of Three Delivery Modes

The means and standard deviations for each of the faculty effectiveness measures by mode are reported in Table 3.

Table 3: 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 4, for classroom vs. video conference in Table 5, and for online vs. video conference in Table 6. Each table is followed by a discussion of the significant findings.

Table 4: *T*-Tests for Faculty Effectiveness by Mode: Classroom vs. Online

Effectiveness Measures	<i>t</i>	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 4 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 5: *T*-Tests for Faculty Effectiveness by Mode: Classroom vs. Video Conference

Effectiveness Measures	<i>t</i>	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 5, 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.

The results of the analysis, presented in Table 6, 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 6: T-Tests for Faculty Effectiveness by Mode: Online vs. Video Conference

Effectiveness Measures	<i>t</i>	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.

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."

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.

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.”

III. SUMMARY

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.

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

Robert J. Koenig, Ed. D. is an Assistant Professor at the New York Institute of Technology. He is an Executive Director for Student Advancement Programs for the School of Management at NYIT whereby he oversees many of the school's initiatives, such as: *Mentoring Programs, Delta Mu Delta Honor Society Chapter Xi, Coaching Programs, Student Advisory Boards, Community Service and Out Reach Initiatives, School Clubs and Professional Associations and Organizations.*

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REFERENCES

1. American Federation of Teachers. (2000). *Distance education: Guidelines for general practice*. Washington, DC: Author.
2. American Distance Education Consortium. (2003). *Guiding principles for distance teaching and learning*. Washington, DC: Author.
3. Daniel, J. S. (1999). *Mega-universities and knowledge media*. London: Kogan Page.
4. Institute of Higher Education Policy. (2000). *Benchmarks for success in Internet-based distance education: Quality on the line*. Washington, DC: National Education Association.
5. Levin, H. M., & McEwan, J. P. (2001). *Cost-effectiveness analysis* (2nd ed.). London: Sage.
6. 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>
7. National Education Association. (2000). *Benchmarks for success in Internet-based distance education*. Washington, DC: Author.