Why Not Blend Face-to-Face and Online Course Environments?

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Abstract

Since before the middle ages, the preferred environment for student learning has been the lecturing professor and the listening student. Recently, theory and technology has caused this traditional educational model to be challenged. As one of the drivers of change, distance learning courses offered over the Internet have shifted the professor's lecture role to one which has a great emphasis on being a guide, a mentor and a facilitator. This paradigm shift has produced research projects and journal articles which argue both sides of the question concerning which environment (classroom or distance) provides for better student learning. It is the intent of this paper to promote a hybrid learning environment built on the best features of the face-to-face and distance learning environments. Hybrid or "blended courses" typically mix distance learning technology with traditional classroom approaches. For instance, one form of a hybrid course might meet 50% of the time, in class, face-to-face, once a week. The other 50% of class time would be conducted via the Internet. This paper examines both the classroom and Internet environments with respect to student satisfaction and to student learning levels. Based on the comparison results, the paper concludes that blended, hybrid courses can better serve a wide spectrum of selected student learning styles and yield high quality learning outcomes.

Introduction

From the mid-1990s until the turn of the century, higher education course activities were conducted either in the traditional classroom setting, often using the lecture format, or in the virtual classroom setting using computer and networking technologies. During this time period, more and more brick and mortar leaning institutions augmented their classroom offering with courses offered via the Internet (1). New competitor institutions, which provided their courses strictly at a distance, sprang up. Some of the startups prospered and grew while others were short lived (2).

As the twentieth century came to an end, another alternative began to appear – the hybrid course (3). One form of hybrid blending came out of Fairleigh Dickinson University in New Jersey. FDU required all of students to take at least one online course every year leading to a blended degree program. Rochester Institute of Technology in New York required that every course have some online components (4). RIT provided the support tools in order for faculty to implement this blended course requirement. Course formats which substituted Internet delivered learning

modules in place of classroom meetings proved to have advantages for the leaning institution as well as for various segments of the student body. Several of the University of Phoenix campus sites offer a blended form for courses where a third of the meetings are face-to-face and the other two-thirds are conducted over the Internet (5). The blended course environment is fast finding itself becoming an effective and efficient alternative to both the classroom model and the distance learning model.

Technology Variations on Course Format

The major motivation behind any method of teaching is student learning. The traditional lecture based educational system has worked for centuries. But in the latter half of the twentieth century, technology availability began to strongly influence the classroom model of teaching. Debates became common as to whether face-to-face instruction was best because not all students excel in a lecture format. But, if not the traditional approach, what form best improves the educational experience for students. In addition to courses provided in the synchronous, traditional, lecture format, the following course formats were becoming available for both on and off campus students.

1. Web-enhanced courses – These courses are traditional classroom courses that contain online, Internet-available content. The Internet-available portions of a web-enhanced course are often presented as optional learning tools for the student. Videotapes and streaming files are also popular teaching tools.

2. Online courses - Most online courses allow students to take the course entirely via the Internet without ever physically coming to campus. Students can access the distance learning course information 24 x 7 from any Internet enabled computer, anytime, anywhere. The majority of these courses are conducted in a completely asynchronous mode. Others may use some synchronous tools like conference phone calls.

3. Hybrid (blended) courses – These hybrid courses include a balanced blend of classroom and distance learning. This content varies from course to course but may include PowerPoint charts, class notes or text lectures, online laboratory submissions, online testing, and possibly, even, class discussion forums.

The research presented in this paper examines student satisfaction and learning levels for traditional and online courses. A lack of variation between these two course formats is a strong indicator of the value of the blended format.

Examples of Blended Hybrid Course Environments

Blending at Fairleigh Dickinson University - Besides being required to take at least one online course per year (8), all freshmen at Fairleigh Dickinson University are required to take an online course called "The Global Challenge," which is a revision of a class the university has traditionally offered. The course is largely taught online with six or seven in-person meetings throughout its duration. It is reported that students have accepted the online-learning requirement and, of

course, they realize that a traditional course format might require an early morning meeting schedule. However, anyone who has taught or taken such an online course knows that the online format requires a high level of organization by the student. Reports have stated that some students had difficulty adjusting to the virtual-classroom environment. FDU realized that students may not like the online format but that format is important since most students will probably need to know how to take online courses after they leave the campus. Later in their careers, many decide to take continuing-education courses, which often are offered online. One of the goals of the FDU policy is to teach students how to succeed in the virtual learning environment. In the implementation of this policy, the presence of blended courses provided the best of both worlds, offering the convenience of entirely online courses and eliminating the feel of being alone by providing some degree of student teacher interactions.

Blending at the University of Phoenix - University of Phoenix (UOP) operates a number of geographically dispersed ground based campus locations as well as an Online campus where all courses are offered asynchronously via the Internet. The focus at UOP is the working adult student and so classes at the ground campus locations are conducted in the evenings. Students take one course at a time in a time-condensed, intensive and highly focused environment. Undergraduate courses consist of five meetings and most graduate courses consist of six meetings (6). One attendance format that UOP offers at many of its classroom based campus locations is called FlexNet. FlexNet conducts the first and last workshop meetings for a course in the classroom, and the middle ones are conducted online using an Online course management software system. FlexNet retains elements of both the traditional and virtual delivery methods in a blend which satisfies students needs. Currently UOP is running a number of FlexNet programs -- mostly in Arizona and the southwest. Students and faculty meet together, in a face to face manner for the first workshop, and again for the last session. These meetings are used to initialize the course, do oral presentations and to wrap up of the course. In Tucson, the classroom workshops are held on a Saturday. The last workshop of a group's current course is conducted in the morning, and the first workshop of the group's next course takes place in the afternoon. This arrangement requires students to be on-campus only once every six weeks. FlexNet has been popular and successful in achieving high levels of student satisfaction. UOP students love the mixture of classroom and online delivery. The blended environment of FlexNet is a nice choice for students who are close enough to a campus to attend every six weeks, but far enough away to not want to come every week.

Blending at Rochester Institute of Technology – Rochester Institute of Technology (RIT) has offered applied technology education since 1829. Today, RIT is internationally respected as a world leader in career-oriented and professional education with over 15,000 students seeking a wide variety of undergraduate and graduate degrees. After instituting a policy which requires every course to contain some online content, at the start of the 2002 academic year, the number of blended courses increased. In support of the policy, RIT rolled out myCourses -- a course management tool used to improve communications and to create a web presence. During the fall quarter, more than 525 courses and 8,800 students actively used myCourses which creates a "course shell" website for every course. This allowed instructors to post information and files for their particular courses to the web without any knowledge of html, web programming or web design. Content is entered into a myCourses shell through the use of web forms that an instructor

fills out. Communication with students can be enhanced with myCourses through the use of integrated class email lists, discussion boards or live chat rooms. Also available are an online grade book along with a tool for creating online tests and surveys.

Comparison of Course Formats

The Electrical, Computer and Telecommunications Engineering Technology Department at RIT developed a three-course sequence which teaches technical programming skills. The foundation objective for the course sequence is that students learn the grammar and syntax of the C++ language and how to utilize software tools to solve typical technical problems. Each of the three courses includes a set of activities (readings, lectures, problem solving exercises, laboratory assignments and testing) which promote student learning. All three courses contain elements which follow ABET guidelines and, more importantly, meet the current and future needs of ET students. Besides the grammar and syntax elements of the C++ language, the courses emphasize technical problem solving, software engineering practices, project management, aspects of working in technical teams and good written and verbal communications (8).

After development and delivery of each course in the classroom environment, a distance learning version was prepared for delivery in an asynchronous manner over the Internet. The distance learning versions were heavily based on the philosophies and approaches used for the classroom version. Conversion to the virtual environment required that materials, lectures, assignments and testing methods be evaluated with respect to the levels at which they supported student learning. The major changes were made to encourage increased student to student interactions and remote testing.

Student satisfaction opinions were collected for both the traditional lecture version and the online version of the courses. The results of these student evaluation surveys are summarized in Tables 1 and 2, below. The student responses were originally used to determine strengths and weaknesses of the course presentation techniques.

For Internet delivered sessions of the courses, Table 1 presents results of the student surveys with respect to the course aspects listed in the left hand column of the table. The completely online, asynchronous version of the course was presented four times. The author was the faculty member for all four sessions. For almost every day of the course, he entered the course environment at least twice a day to answer questions or comment (encourage and guide) on student activities. The same textbook was used for all four sessions. For the most part, assignments and grading criteria were consistent between the four sessions.

Student satisfaction with the traditional classroom (lecture style) version of nine sessions of the course can be seen in Table 2. For both the online and the classroom sessions, the faculty member, textbook, assignments and grading criteria were nearly identical.

As can be seen in Table 3, a comparison of the two environments, no significant difference between the nine classroom sessions and the four online sessions is observed in any of the student satisfaction categories. A Z-statistic (computed from the following formula) was used to test

whether the difference between any of the pairs of means is significant.

$$Z = \frac{X_1 - X_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

At the 0.01 confidence level, the difference between any pair means in Table 3 is attributed to chance. There is no statistically significant difference between the pairs of means.

Table 1. Distance Delivered Courses	***#1***	***#2***	***##3***	***4***	
Factors Related to Faculty Performance					Average
1. Effective in explaining and discussing course material	4.00	4.43	5.00	4.00	**4.36**
2. Organization and preparation for the course	4.75	4.72	5.00	4.83	**4.83**
3. Receptive to student questions and concerns	4.00	5.00	5.00	5.00	**4.75**
4. Quality of responses to student questions and concerns	3.75	4.72	5.00	4.83	**4.58**
5. Availability for individual student assistance	3.25	5.00	5.00	4.50	**4.44**
6. Used teaching techniques and styles that promoted learning	3.50	4.42	4.34	4.16	**4.11**
7. Timely return of graded work	4.00	4.42	4.34	5.00	**4.44**
8. Overall satisfaction with your instructor	4.00	4.29	5.00	4.33	**4.41**
Other Course Related Factors					
1. Stated course objectives were met	4.25	4.42	4.34	4.33	**4.34**
2. Value of the assignments in helping you to learn the material	4.00	4.72	5.00	4.00	**4.43**
3. Value of the textbook in helping you to learn the material	3.75	4.72	5.00	4.50	**4.49**
4. Satisfaction with how much you learned in this course		4.72	4.34	4.00	**4.35**
5. Overall satisfaction with the course	3.75	4.43	4.67	4.16	**4.25**
Average of the above factors (5 = very good & 1 = very poor)	3.89	4.62	4.77	4.43	**4.43**
Percentage of student grades B and A	50.00	50.00	69.00	93.00	**65.50**
Percentage of student grades C and below	50.00	50.00	31.00	7.00	**34.50**

Table 2. Survey Results For Nine Traditional Classroom Courses

Factors Related to Faculty Performance										Average
1. Effective in explaining and discussing course material	3.81	4.03	3.95	3.69	4.48	4.21	4.08	4.22	4.31	**4.09**
2. Organization and preparation for the course	4.7	4.34	4.6	4.62	4.7	4.44	4.72	4.62	4.78	**4.61**
3. Receptive to student questions and concerns	4.7	4.56	4.5	4.46	4.86	4.78	4.42	4.75	4.58	**4.62**
4. Quality of responses to student questions and concerns	3.91	3.83	3.9	3.72	4.66	4.21	4.13	4.3	4.37	**4.11**
5. Availability for individual student assistance	4.47	4.8	4.6	4.88	4.88	4.88	4.74	4.44	4.79	**4.72**
6. Used teaching techniques and styles that promoted learning	2.86	3.44	3.6	3.44	4.18	3.7	3.76	3.8	3.96	**3.64**
7. Timely return of graded work	3.92	4.22	3.42	4.21	4.4	4.56	4.42	4.36	4.48	**4.22**
8. Overall satisfaction with your instructor	3.73	3.77	3.75	3.63	4.56	4.11	4.07	3.96	4.31	**3.99**
Other Course Related Factors										
1. Stated course objectives were met	3.62	3.88	4.5	3.92	4.7	3.88	4.34	4.1	4.36	**4.14**
2. Value of the assignments in helping to learn the material	4.08	4.22	4.2	4.36	4.7	4.25	4.72	4.24	4.38	**4.35**
3. Value of the textbook in helping you to learn the material	2.38	4.25	3.8	4.08	4.48	1.46	4.07	4.03	4.04	**3.62**
4. Satisfaction with how much you learned in this course	3.14	4.22	4	3.69	4.62	3.69	4.34	4.18	4.16	**4.00**
5. Overall satisfaction with the course	3.3	3.95	3.8	3.73	4.45	3.87	3.93	4.04	4.11	**3.91**
Average of the above factors (5 = very good & 1 = very poor)	3.74	4.12	4.04	4.03	4.59	4	4.29	4.23	4.36	**4.16**
Percentage of student final grades B and A	80	65	56	50	86	92	51	48	78	**67.33**
Percentage of student final grades C and below	20	35	44	50	14	8	49	52	22	**32.67**

Table 3. Compare Classroom to Distance Courses	Traditional Courses	Distance Courses	Difference
Factors Related to Faculty Performance			
1. Effective in explaining and discussing course material	**4.09**	**4.36**	**0.270**
2. Organization and preparation for the course	**4.61**	**4.83**	**0.220**
3. Receptive to student questions and concerns	**4.62**	**4.75**	**0.130**
4. Quality of responses to student questions and concerns	**4.11**	**4.58**	**0.470**
5. Availability for individual student assistance	**4.72**	**4.44**	**-0.280**
6. Used teaching techniques and styles that promoted learning	**3.64**	**4.11**	**0.470**
7. Timely return of graded work	**4.22**	**4.44**	**0.220**
8. Overall satisfaction with your instructor	**3.99**	**4.41**	**0.420**
Other Course Related Factors			
1. Stated course objectives were met	**4.14**	**4.34**	**0.200**
2. Value of the assignments in helping to learn the material	**4.35**	**4.43**	**0.080**
3. Value of the textbook in helping you to learn the material	**3.62**	**4.49**	**0.870**
4. Satisfaction with how much you learned in this course	**4.00**	**4.35**	**0.350**
5. Overall satisfaction with the course	**3.91**	**4.25**	**0.340**
Average of the above factors (5 = very good & 1 = very poor)	**4.16**	**4.43**	**0.270**
Percentage of student final grades B and A	**67.33**	**65.50**	**-1.830**
Percentage of student final grades C and below	**32.67**	**34.50**	**1.830**

One Additional Aspect of Blended Courses

Roughly 1,100 RIT students are deaf or hard of hearing, with 235 of them pursuing bachelor's or master's degrees in a science or math field. This population comes to RIT with a wide variety of communication skills, from fluent in American Sign Language to those who have never signed. Although most of the information is anecdotal in nature, the hearing impaired students appear to achieve higher levels of success in a course with online content than in a traditional classroom based course. This is another justification for the use of a blended course delivery system at RIT. The blended environment eliminates some of the communications difficulties experienced in traditional course settings. A current research project is gauging deaf and hard of hearing student comprehension based on variables such as interpreters' backgrounds and experience, as well as student skills at following sign-language interpretation and their own educational backgrounds. Other aspects of the research are looking at how students perform based on different teaching styles and how much students comprehend when interpreters with some science knowledge

interpret a lecture. The study includes groups made up of RIT faculty, sign-language interpreters and both hearing-impaired and hearing students. Results of this work will be presented at a future time.

Conclusion

The academic teaching world is in a state of transition trying to define those best course delivery practices which lead to optimum student satisfaction and high levels of student learning. The survey data presented in this paper confirms many previous studies which concluded that student satisfaction differences do not exist between the traditional classroom based methods and asynchronous distance delivery modes. The data go one step further to indicate that student learning levels are not significantly different for traditional classroom based delivery and asynchronous distance delivery modes. Furthermore, this data analysis indicates that blended courses delivered using a hybrid mix of traditional classroom and online teaching techniques can also achieve high levels of student learning. More research of the type presented here is ongoing to determine what works and what doesn't with respect to course delivery for select vertical segments of the overall student population. Traditional classroom based, fully online asynchronous and hybrid blended are all valuable course presentation environments.

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