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ABSTRACT

This project examined whether the quality of instruction delivered to both an on-site and a reception classroom could be equalized through the multimedia combination of interactive video and the Internet. The course was a telecommunications class offered by Bowling Green State University (Ohio). The transmission site was a tele-teaching room at the university; the reception site was located at Columbian High School in Tiffin, Ohio and was composed of in-service teachers and staff taking the course for graduate credit. At the outset of the course, online students filled out a preliminary survey that dealt with general computer literacy and Internet usage. At the end of the course, students completed an evaluation survey that examined quality of learning, quality of class material sand instruction, availability of materials, management of the learning process, monitoring and feedback activity, objectives, and personal reactions. Results indicated that it might be possible to place so much emphasis on the remote classroom that students in the more traditional transmission site feel neglected. While the combination of compressed video transmission and Internet resources can provide for rich distance education learning, achieving a balance between the two sites presents the instructor with unique challenges. The questionnaires are appended. (AEF)

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And the Walls Came Tumbling Down: Augmenting the Distance Education Experience

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Paper presented at the National Communication Association Annual Convention, Chicago, IL, November 22, 1997

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"And the walls came tumbling down: Augmenting the distance education experience."
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A fundamental aspect of educational reform is the professional development of teachers. How can states provide similar professional development opportunities to teachers who cannot access a university classroom? This project explored the effectiveness of one solution, the combination of Internet and interactive video to provide fundamentally identical instruction to a university classroom and reception site at a rural high school.

Although studies have examined interactive video (Russell, 1992) and Internet instruction (Mende, 1996) this project evaluated the effectiveness of combining the "face to face" quality of interactive video together with the powerful interactively and informational content of the Internet.

Project Questions

The primary question in this project was: Could the quality of instruction delivered to both the on-site and reception classrooms be equalized through the multimedia combination of interactive video and the Internet? Previous studies of interactive video instruction have found the students at reception sites face more challenges to learning than do students in traditional classroom settings (Dillion & Walsh, 1992; Tiene, 1997).

Students at reception sites have reported difficulties maintaining attention during class lectures and activities. Reception site students also may ask fewer questions than in a traditional classroom (Tiene, 1997). By combining e-mail access to the course instructor and Internet-based tutorials and exercises, it was hoped that these limitations could be overcome. If these limitations were in fact overcome, the students at both the transmission and reception site would express equal satisfaction with the class and would find the lecture and Internet class material of equal value.

A derivative issue explored in this project was: How does extending the classroom to a reception site impact on the effectiveness of the instructor and the classroom interaction at the instructor's classroom? By utilizing multimedia, is it possible to maintain a high level of interactivity, social learning and peer tutoring could be provided to a large number of students at both reception and instructor lead classrooms?

Site and Course Descriptions

The course was a telecommunications class offered by Bowling Green State University that deals with new electronic media, primarily

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the Internet and World Wide Web. The transmission site class was composed, primarily, of traditional college age students who were upper class undergraduates or first year Master's students. The reception site was located at Columbian High School in Tiffin, Ohio and was composed of in service teachers and staff (e.g., one librarian) taking the course for graduate credit.

The reception class site and transmission site both contained equipment for the transmission and reception of compressed video. The reception site operated with a Venue 2000 Model 50 Videoconference system operating at 7kHz audio compression. This system included T-1 interface and a 32" (81.2 cm) monitor with Bose videoconference speakers and a Conference Control Wireless IR Keypad. This allowed reception site students to view and hear the instructor as well as students at the transmission site.

A Cannon Document Camera allowed materials at the reception site to be sent to the transmission site for viewing by the instructor and transmission site students. This option was rarely needed. Audio was transmitted from the reception site to the transmission site via a PowerMac 360 Directional microphone.

The transmission site was a tele-teaching room at Bowling Green State University equipped with four Sony DXC 930 cameras, three wall-mounted and one on a camera stand. These provided video for compressed transmission of video through a five-line Genter telephone connection using ISDN line to transmit to Columbus, Ohio where the signal was switched to T1 lines for re transmission to Tiffin. Wireless microphones worn by the instructor and pressure sensitive microphones are placed on the student desks to allow both sites to hear student questions and lecture information. Two large screen Sony large screen projectors that were VGA/Super VGA compatible allowed students at both sites to view each other and the instructor or lecture computer simultaneously, thereby creating a "one classroom" effect.

The interactive nature of the class was increased by the use of a class web page. The page, referred to as a "living syllabus," (http://www.bgsu.edu/departments/tcom/451.html) was designed to provide students with asynchronous on-line assistance with every aspect of the course. Links were not only provided to interactive information such as assignments, tests and evaluations along with a wide variety of information resources and tutorials.

Sections on web page creation, information searches, electronic mail and educational uses of the Internet gave students a rich source of supplemental instruction and assistance. The web page also provided easy e-mail communication with the course instructor via a hyper-link. In the advent of a failure of the interactive video system, students could access assignments on-line. A student assistant at the reception site was available to answer student questions regarding the course.

Information Gathering Methods

At the outset of the course, the students on-line filled out a preliminary Internet Skills Assessment survey: (http://www.bgsu.edu/departments/tcom/assess.htm). The questionnaire was not a pre-test of content area knowledge because students were unlikely to have information regarding the subject matter. The questionnaire dealt with general computer literacy and Internet usage.

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Its original function was to assist the instructor in tailoring the course to meet the needs of the students.

Through the preliminary on-line questionnaire, it was discovered that a majority of transmission site students had home computers and all had active e-mail accounts. Most of the students did not have Internet access from home and only one student had a homepage on-line. Three quarters of the reception site students had home computers with Internet access and e-mail accounts.

Selected Student Reactions to the Tele-course Project

Because there were only 5 students at the reception site and 14 at the transmission site, no statistical analysis was conducted. The students did rank 36 statements on a five-point Distance Education Class Evaluation Likert scale (1 = Strongly Agree - 5 = Strongly Disagree) and responded to four open-ended questions. Responses to 11 Distance Education Class Evaluation questions considered most relevant to the project are described here and the entire form may be accessed at:(http://www.bgsu.edu/departments/tcom/eval.htm).

On the Distance Education Class Evaluation form, all students at both sites agreed or strongly agreed with statement 7: "The instructor was clear and understandable in his presentations." This indicates that the interactive televisions lecture was considered as effective as in person class presentations.

In responding to statement 15: "I think I learned as much in this class as I would have in a traditional classroom." 12 of the 14 transmission site students and four of the five reception site students agreed or strongly agreed. This response is consistent with over 60 years of media comparison studies (Mayer, 1997). The same level of agreement was obtained when statement 23:" I established a good working relationship with the course instructor."

All students at both sites agreed or strongly agreed with statement 13: "The class Web site speeded the exchange of class material." Twelve of the 14 transmission site students along with all reception site students agreed or strongly agreed with statement 18: "The class Web page provided easy access to additional relevant information and resources."

These responses indicate that the combination of Internet resources and compressed video did provide positive learning opportunities for both transmission and reception site students. Other responses, however, indicated that some traditional classroom activities were compromised to accommodate the distance education environment.

Ten transmission site students and three reception site students agreed or strongly agreed with statement 32: "I participated in class discussions in this class as much as I normally would in a traditional classroom" indicating diminished classroom interaction. The instructor's ability to hold the attention at the transmission site seemed to be less strong than at the reception site. Five of the 14 transmission site students and one reception site student agreed or strongly agreed with statement 26: "I found it more difficult to pay attention in this class than I usually do in a traditional classroom."

Transmission site students also expressed greater feelings of alienation. Six transmission site students agreeing or strongly

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agreeing with statement 27: "I felt alienated from the students at the other learning site" while only one reception site student agreed with the statement. Ten out of 14 students at the transmission site agreed or strongly agreed with statement 9: "The instructor gave more examples in class than were required", while only one of the five reception site students agreed with the statement. Computer demonstrations may be more understandable in a classroom setting than they are if viewed on a large monitor.

Five of the 14 transmission site students agreed with statement 21: "I would prefer taking tele-courses rather than taking traditional classroom courses," while reception site students unanimously agreed with the statement. When asked to rate statement 33: "I understood the class was a distance education class before I registered," only four transmission site students agreed or strongly agreed with the statement, while all reception site students agreed.

The more negative ratings given by the transmission site students to some statements may have been due to the "surprise" factor of not knowing that they had registered for a tele-course. Therefore they did not understanding that they would be sharing the instructor's attention with the reception site. The overwhelmingly positive response of the reception site students may reflect the fact that they were a self-selected group of students specifically seeking a tele-course experience.

Implications of the Project

Traditional studies of distance education have found that students at reception sites face more challenges than do students in traditional classrooms (Tiene, 1997). Our project indicated that it might be possible to place so much emphasis on students at the remote site that students in the more traditional transmission site classroom began to feel neglected. While the combination of compressed video transmission and Internet resources can, without question, provide for rich distance education learning, achieving a balance between the transmission and reception site classrooms presents the instructor with unique challenges.

One clear perquisite for creating such balance is informing each student registering for a tele-course distance education class that it is a distance education class and what that fact implies. Students who expect the constant attention of the instructor or who may find the course material especially challenging may not want to register for a tele-course. As distance education classes and media-based instruction proliferates, this issue may become less problematic.

Another issue of balance is understanding that the impact of the instructor is greater in the classroom than it is via any medium, even sophisticated interactive video or Web pages. Instructors may find it helpful not to stress points or provide copious examples of problems that may reach the reception classroom but overwhelm the transmission site students. Additional examples and questions may be provided to reception site students via e-mail or Web-based tutorials.

The student's perception of alienation was not overcome in our project even with the rich media environment we created. Students at the transmission site expressed more feelings of alienation than did the students at the reception site. Students at transmission sites may feel that they are the real classrooms and the reception site students

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are merely observers. One student at the transmission site responded to the question: "What impact has this experience had on your attitude toward enrolling in a distance learning course in the future?" by commenting "I did not like it. I found them distracting."

Conclusion

The application of new media will provide K-12 and higher educational institutions with the ability to bring more quality learning to larger numbers of students than ever before. Discovering ways to combine classroom instruction, Web based media and tele-courses into effective instructional programs will be a great challenge for educators in the 21st Century.

Acknowledgments

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http://www.bgsu.edu/departments/tcom/a

Note: Please print this form when done *do not email!*
Print blank form and handwrite answers if necessary.

This survey is to help me better meet individual student needs in the class. Please answer each item as honestly as possible by Wednesday's class. This printed fine for me Tuesday in the Tech Windows Lab; BGSU lab Macs might be a problem.

Your Name:

Your Preferred Email Address:

What is your BGSU student ID number?

Are you currently registered for this class?

- ○ Registered
- ○ Not Registered

In what academic class are you right now (before taking this course)?

- ○ Freshman
- ○ Sophomore
- ○ Junior
- ○ Senior
- ○ MA student
- ○ Ph.D. student

What is your major?

What is your favorite HTML editor (leave blank if none)?

None

Which of the following statements best describes your primary reason for taking this class?

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- ○ Required course for TCOM majors
- ○ I'm not a TCOM major, but it fills a requirement for my graduation
- ○ I'm not a TCOM major and I'm taking it as an elective
- ○ I'm a **Tiffin** EDCI 680 grad student
- ○ I'm a **New Lexington** EDCI 680 grad student
- ○ I'm a grad student and I'm taking it as an elective

Do you use a computer at home?
○ Yes
○ No

Do you have and use Internet access from home? Internet access includes any commercial online service like America Online and any other Internet provider (e.g., you can use Netscape and/or Internet Explorer at home).
○ Yes
○ No

If you have used the Internet, about how often do you use each of the following tools?

Email	Listservs	Newsgroups
○ 2 or more times a day	○ 2 or more times a day	○ 2 or more times a day
○ about once a day	○ about once a day	○ about once a day
○ a few times a week	○ a few times a week	○ a few times a week
○ a few times a month	○ a few times a month	○ a few times a month
○ a few times a year	○ a few times a year	○ a few times a year
○ never	○ never	○ never

Downloading and Installing Software	World Wide Web
○ 2 or more times a day	○ 2 or more times a day
○ about once a day	○ about once a day
○ a few times a week	○ a few times a week
○ a few times a month	○ a few times a month
○ a few times a year	○ a few times a year
○ never	○ never

About how many hours do you actively use these Internet tools on an average weekday?

About how many hours do you actively use these Internet tools on an average weekend day?

How many commercial online services have you used in the past year (e.g., America Online, CompuServe, etc.)?

What, if any, active commercial account do you have today? (Hold down *Control* to select or deselect multiple items [*SHIFT* for the Mac].)

- America Online
- Compuserve
- Pathway (Tiffin)
- Prodigy
- Wood County Freenet
- Other
- None

How many *active* email accounts do you have right now (e.g., bgnet, Freenet, work, America online, etc.)? [ ]

If you have a personal home page, how long has it been online ***in months***? [ ]

Finally, to help me understand the different levels of computer experience in the class, please rate yourself on the use of some common software:

- **NEVER USED**: never even tried to use it
- **NOVICE**: have tried it or am learning it but am not proficient at it
- **INTERMEDIATE**: comfortable with it; sometimes need to refer to the help manuals when using it
- **ADVANCED**: been using it for more than 6 months, have completed projects using it, know some tricks when using this software

Photoshop Never Used

PageMaker Never Used

Mac Microsoft Word Never Used

other Mac word processor Never Used

Mac Excel Never Used

Mac Clarisworks Never Used

Windows Microsoft Word Never Used

Windows Word Perfect Never Used

Windows Excel Never Used

Other Windows spreadsheet (Lotus 1-2-3, Quattro Pro) Never Used

---

Think about all the work (and play) you do on just Windows or Macintosh computers. **What percentage of that time do you spend on a *Macintosh*?** (If

you use only a Windows or DOS machine, answer 0.)

To which of the following magazines do you either currently subscribe or regularly read (i.e., read part of each issue)? (Hold down *Control* to select or deselect multiple items [*SHIFT* for the Mac].)

- Internet World
- NetGuide
- Wired
- Any Mac computer magazine
- Any other computer magazine

I want to learn about the Internet because:

What I most expect to learn from this course is:

How do you expect the WWW to impact your career as of today?

What, if anything, do you see as the #1 issue facing the WWW today?

Please do NOT Press! Print instead!

Print blank form if necessary and hand write answers.

Clear the Form and Start Over

Return to TCOM 451 Home Page

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Revised 31 August 1998

http://www.bgsu.edu/departments/tcom/eval.htm

Please print this document and then circle the appropriate response This is for research purposes only. Please be sure to hand in this completed form today.

TCOM 451 - MCOM 551 Distance Education Class Evaluation

Did your section meet in Tiffin or BG?

- **Tiffin**
- **BG**

Quality of learning
Quality of class materials and instruction

1. This class inspired me to use the World Wide Web in my professional work.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

2. The reception site teaching assistants were very helpful
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

3. This class inspired me to use the World Wide Web for information gathering.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

4. The textbook readings and exercises increased my understanding of the class content.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

5. This class inspired me to use the World Wide Web for communication.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

6. The instructor gave interesting and informative in class presentations.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

7. The instructor was clear and understandable in his presentations.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

8. The in class examples given in class were helpful
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

9. The instructor gave more examples in class than were required.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

10. The instructor gave an insufficient number of examples in class.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

11. The computer facilities provided in class were adequate and current.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

12. The in class lab time was necessary for my mastery of the class material

1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

Availability of materials

13. The class Web site speeded the exchange of class material
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

14. The class Web site expedited the grading and return of class assignments
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

15. I think that I learned as much in this class as I would have in a traditional classroom.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

16. The class Web page provided easy assess to the class syllabus
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

17. The class Web page provided easy access to the class assignment sheets.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

18. The class Web page provided easy access to additional relevant information and resources.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

19. The online resources used in the class were current.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

20. The online resources used in the class were helpful.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

21. I would prefer taking telecourses rather than taking traditional classroom courses.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

22. I would prefer taking traditional classroom courses rather than taking telecourses.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

Management of the learning process

23. I established a good working relationship with the course instructor.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

24. The visits of the instructor to the reception site was necessary to build class rapport.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

25. E-mail contact with the instructor was necessary in building class rapport.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

26. I found it more difficult to pay attention in this class than in usually do in a traditional classroom.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

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27. I felt alienated from the students at the other learning site.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

Monitoring and feedback activity

28. I asked as many questions in this class as I normally would ask in a traditional classroom.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

29. I addressed most of my questions in the class to the instructor.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

30. I addressed most of my questions in the class to the teaching assistant(s).
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

31. I addressed most of my questions in the class to the instructor via e-mail.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

32. I participated in class discussions in this class as much as I normally would in a traditional classroom.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

Objectives

33. I understood that I would be making Web Pages before I registered for the class.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

34. I understood that I would be using Search Engines before I registered for the class
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

35. I understood that the class was a distance education class before I registered.
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

36. I understood that I would be conducting course work via e-mail and internet before I registered for the class
1. Strongly Agree 2. Agree 3.Not Sure 4.Disagree 5. Strongly Disagree

Personal reactions (continue on the back if you'd like)

What was your overall impression of the course?

_____
_____
_____
_____
_____
_____

What portion of the course did you find most helpful?

_____
_____
_____

What portion of the course did you find least helpful?

What impact has this experience had on your attitude toward enrolling in a distance learning course in the future?

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