

The Multi-site Interactive Video Curriculum in Advanced Data Analysis for Political Science

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Authors are listed alphabetically. We would like to thank Herb Weisberg for helpful comments.

In the 1995-96 academic year, an exciting experiment was conducted in distance education. In the fall semester, Illinois, Minnesota, Ohio State, Pennsylvania State, and Wisconsin universities participated in at least one of four interactive multi-site video presentations. In the spring, a class in Time Series Analysis was offered using the same technology with Illinois, Minnesota, Ohio State, and Wisconsin Universities participating. W. Phillips Shively, currently Provost at the University of Minnesota, was the impetus behind the project. He asked interested Committee on Institutional Cooperation (CIC) political science departments to send representatives to a meeting at the 1995 Midwest Political Science Association annual conference to discuss the possibility of launching it.¹ In the summer of 1995, the group met in Chicago with Roger Clark, Director of the CIC, and Michael Staman, President of CICnet. The project went forward with planning, technical, and monetary assistance from the CIC and the participating universities' departments, administrations, and technical staff. Testing for technical compatibility occurred over the summer. The project was launched in the fall of 1995 with Chris Achen, Larry Bartels, Henry Brady, and John Freeman, all former presidents of the American Political Science Association's political methodology group, presenting their current research in a series of interactive video conferences. The fall of 1996 presentations were made by Gary King, Michael Alvarez, Jon Krosnick, and Renée Smith.

The project was intended to build a larger community of scholars in quantitative methods, improve the quality of faculty and student work, and overcome a very practical problem: the expensive nature of graduate instruction in the area of quantitative methods (Freeman and Shively 1995). The project also served as a test for the practicality of multi-site interactive video teaching by people who are novices in using the technology. The long-term vision of the project includes a regular seminar series and regular offering of four advanced modeling classes on a rotating basis. John Freeman is serving as director of the project.

Political methodology is a growing field. Because of the connections within this field that are fostered by the annual political methodology group summer meeting and the comparative advantage the departments of the CIC enjoy in this area, the project became a promising case study.

¹ The CIC is the consortium of the eleven "Big Ten" universities, plus the University of Chicago.

Beyond this, as the empirical puzzles in political science increase in their complexity, learning and developing methodological tools is likely to be useful. Not surprisingly then, the demand for political methodologists and the need for classes to train these individuals drastically have increased. Unfortunately, study in this field demands a significant amount of course work on the part of the student and the availability of courses offered by those who have the experience and skill to teach them. “Because the work builds on a strong base of prerequisites that take time to acquire, and because much of the work involves highly specialized seminars, it is typically taught in very small classes. It is hard for most departments to justify carrying the necessary number of specialized faculty . . .” (Freeman and Shively 1995, 1). As universities mandate higher and higher minimum enrollments for courses, it is also problematic for instructors to regularly offer specialized courses in their area of expertise. For these and other reasons, universities are beginning to recognize the need for distance education offered through interactive video.

This article highlights the advantages and disadvantages of the project, drawing from Sutton’s (1997) more systematic evaluation of the course. Our evaluation does not address issues related to the topic of the first course, which was Time Series Analysis, team-taught by John Freeman, University of Minnesota, and Janet Box-Steffensmeier, Ohio State University, or the quality of the syllabus, readings, or lectures. Rather we focus on the use of the technology in the class and the opportunities and problems created by the medium. Suggestions for improvement of future multi-site interactive video courses are interspersed throughout. The primary advantages and disadvantages of the project from the particular perspectives of administrators, instructors, and students are also highlighted in the conclusion.

The Multi-site Interactive Video Class

The mechanics of the seminars worked such that each site saw and heard the person speaking and the speaker saw the last site to speak. The video and audio was “grabbed” simply by speaking (there was about a three second delay for the switch to occur). Twenty-seven students participated as registered students or auditors. A number of faculty also took part. The students had varied backgrounds, areas of interest, and levels of expertise.

Sutton’s (1997) evaluation revealed that most of the students enrolled in the class because of the topic and did so with positive expectations about the experience.² Sutton concludes that “prior experience with instructional technology was correlated with positive attitudes” and there was not a substantial change in attitudes about the course: “those with positive attitudes retained them in spite of occasional difficulties, and those who were selectively skeptical remained so” (1997, 2).³ Table 1 summarizes the most frequent likes and dislikes of the students interviewed by Sutton.

²Sutton’s (1997) evaluation is based on telephone interviews with fourteen students, six faculty members (including the principal instructors, faculty members who sat in on some of the sessions, and department chairs), and five technical and support staff persons. Additional data was provided by a written survey, class evaluations, and a focus-group discussion conducted by Sutton at the end of the last class session (with faculty absent) 1997, 2).

³Approximately half of the students had prior experience in the sense of participating in the project’s speaker series in the fall prior to the course beginning in January.

We discuss the strengths and weaknesses of this medium in comparison to those of a traditional seminar. We start with the premise that the technology is only successful if it affords advantages that are impossible in a traditional format; otherwise, the expenses and extra work born by the university and the instructor are futile.

Strengths of the Medium

When comparing this approach to the traditional format, several advantages of the multi-site interactive video become apparent. First, students interested in learning advanced methods have access to instructors specialized in a particular area, and in the case of the Time Series Analysis course, students benefitted from the expertise and comments on assignments of two instructors. The instructors' substantive interests differed considerably; Professor Janet Box-Steffensmeier focuses on questions in American politics while Professor John Freeman studies those in Political Economy and International Relations. In addition, each instructor also has somewhat different research interests in methodology. Therefore, students are not only learning from people who use advanced methods and research them, but also benefit from having access to instructors with substantive interests similar to their own substantive interests.

Second, participation by faculty sitting in on the course was extremely helpful. These faculty participants tended to stimulate discussion and brought still more diverse substantive interests to the class. Students, as well as the instructors, benefitted from faculty comments and questions. In a traditional format, such access to so many leading scholars would not have been possible. For example, students at Wisconsin benefitted from Charles Franklin's informal discussions with them outside of the classroom, which helped students organize their questions and ideas for class, while students at all four sites were able to benefit from his experience and insight into the subject of the course.

Another advantage that the multi-site interactive video technology affords, which a traditional seminar does not, is the possibility of assignments that provide interaction between the students and the medium. Short, student-led discussions were assigned for many classes and although such presentations are used in traditional seminars, students in this case gained experience by presenting to audiences more diverse than would be found in a typical classroom setting. Moreover, the students had to be well prepared to explain methodological points so that all participants could follow and then field comments and questions from other students and faculty members from all sites. Such assignments provide excellent preparation for conference presentations, job talks, and future use of this type of medium in presentations and teaching.

Instructors and off-site students found that electronic support mechanisms (the web site, E-mail reflector, and E-mail) were particularly useful.⁴ From an instructor's perspective, answering a question once on the news group in contrast to sending twenty individual E-mails was more efficient. The distribution of data sets through the web site was also a big time saver for instructors

⁴The E-mail reflector allowed comments, questions, and responses to be sent to *all* the participants, in contrast to personal E-mail that is sent from one person to another.

since students could customize the data set they wanted rather than relying on the instructor to do so. A strength of the electronic support tools is that they are asynchronous, which gives the student access to high-quality support outside the classroom, at their own convenience or when they need it, without having to schedule an appointment with an instructor. The effect, for students who take advantage of these resources, is that students maintain a communicative involvement in the course even when they are out of class, which is particularly useful in a distance education context.

Finally, the seminar gave students the opportunity to network with each other; members of the class that shared similar research interests could contact each other through the E-mail reflector and a list of students and their research interests were available from the web site. An informal meeting for seminar participants was arranged at the Midwest Political Science Conference in Chicago, giving the students an opportunity to meet each other in person. This conference was chosen not for the timing in terms of the course, but for convenience since many participants would be attending the conference.

Challenges

The primary weakness of the seminar revolved around the uneasy communication flow. Certain aspects of the technology made discussion more difficult than it would have been in a traditional seminar setting. For example, reading the nonverbal cues that people use to communicate was not possible. The multi-site video technology used for this course allowed only one audio/ video feed to be transmitted at a time. The automated switching equipment sometimes caused speakers to be cut off or introduced a time lag that produced awkwardly long pauses while the other participants waited for the switching equipment to engage. Perhaps pausing more often during a presentation of material for questions or essentially “calling on” sites in turn after an instructor asked a general discussion question would help. The ability to see all sites at one time also would have promoted in-class discussion. Since stimulating discussion was clearly more problematic in the interactive video setting than in a traditional format, the instructors used student presentations as a way to ensure that all students spoke at least once during the class. While some students thought the class requirement of presenting a published article was a good experience, others pointed out that the presentations again highlighted the lack of easy communication since even these presentations more often took the form of a lecture than a discussion. While some student listeners did pose questions and comments, the burden of the discussion ultimately fell on the presenter, a role which some found uncomfortable because of the communication barriers presented by the medium.

Students at sites with no instructors felt disadvantaged; there is a sense of insecurity of not having equal access to faculty. Everything possible must be done to assure that students at these sites are not, and do not feel, disadvantaged. Using “electronic office hours,” a conferencing technology which would enable students to see and talk interactively with instructors one-on-one, would help. But it was not yet available during the course. Electronic office hours technology would also allow the student to run his or her software code to show the instructor assignment

problems.⁵ The student could pull up his or her computer output, so the instructor could see the student and the output. The development of personal relationships in a video classroom appears to be important, just as it is in a traditional classroom, to facilitate the learning process.

Students seemed particularly troubled by the use of the RATS software, which is one of the most useful programs used in time series analysis. Most of the students were unfamiliar with it, which would be the case in anyone's first class in advanced methodology. The class benefitted from the assistance of an advanced graduate student at the University of Minnesota, Mark Smith, who served as a RATS consultant. However, this resource was under-utilized by the students. This was because students found it difficult to discuss programming problems at a distance and because many students fell behind in terms of the due dates of assignments and therefore did not feel comfortable asking about late assignments. The difficulties in using the software necessary for the assignments could be addressed by dedicating more class time to instruction on how to use the software and interpret the results. Needless to say, it is essential that all students have access to and support for the recommended software.

Because of the students' anxiety about not having a local instructor, it appears that dedicating more class time to explicating assignments would have been useful. Off-site students seemed to feel that E-mail (again, a reflector was available as well as personal E-mail) did not provide the needed level of interaction to solve software problems and that sharing results and problems with RATS would have been a valuable exchange in the classroom. Although E-mail was used regularly by students who did not have local access to an instructor, E-mail is not interactive and so ruled out the give-and-take of a conversation. More effective one-on-one communication between the instructor and the students at remote sites, the coordinated delivery of materials through the local library, and better use of the web site, would all help to compensate for the lack of a local instructor.

Although more attention is needed to ease the flow of communication between the instructors and students, the instructors did take great pains to make themselves available to students, an effort which the students noticed and appreciated. Despite the fact that "electronic office hours" were not available, instructors still were available through E-mail, phone or fax. In addition, student evaluations confirmed that instructors dedicated a great deal of time meeting with students to answer questions at their own universities as well as allowing time to communicate with students at the other sites. Both instructors also wrote extensive comments on each piece of written work (five assignments per student), which were mailed to one of the instructors, then mailed to the other instructor, and then mailed back to the student.

⁵ ProShare and CUSeeMe are software packages that would enable us to have electronic office hours (sometimes referred to as video conferencing software). While CUSeeMe is more cost effective because it is an Internet based Macintosh program, and therefore there are no long distance charges. CUSeeMe currently would not permit instructors and students to jointly view the Regression Analysis of Time Series (RATS) output, which is an IBM based product.

Another disadvantage of the medium is that the class size is larger than the typical advanced modeling class or traditional graduate seminar. Although the students benefit from the diversity of perspectives among members of the class, it is more difficult to facilitate class discussion with larger classes. In addition, the medium made students feel apprehensive about commenting in class. Many students were concerned that their comments, good or bad, would be heard by people at four major universities as well as be taped. As a result, the class had more of a lecture format than a traditional seminar. Both faculty and students recognize that methods classes often are lecture-rather than discussion-oriented, but even so anxiety about speaking in class was a big issue for many students.

The difficulties for instructors to use a blackboard spontaneously and for students to be able to keep pace taking notes during the lecture were a hurdle. Since words and equations cannot be easily read on a blackboard through this medium and the equations were so complicated that presentation programs, such as PowerPoint, could not be employed easily, the distribution of lecture notes became necessary. Although preparing specialized (video compatible) lecture handouts ahead of time increased the workloads of the instructors tremendously, they were extremely helpful to the students. The handouts included notes as well as the equations that the instructor normally would have written on the board. During lectures, the instructors tended to move at a quick pace, so the availability of prepared lecture notes made it possible for the students to focus more on listening to the instructor and thinking about the lesson than feverishly taking notes. The quicker pace also resulted in less connect time and therefore cost savings. Once more, the format and medium meant instructors needed more time to prepare for class -- writing large, legible handouts of all lecture notes rather than using a blackboard. There will soon be secure web sites, which is important because of copyright issues, that will allow the instructors to make the lecture notes available more quickly and with less hassle.

Although the interactive video medium was intended to facilitate cross-site communication among students, the degree of interaction among sites was less than the instructors expected. There appear to be at least two reasons for this. First, most students initially did not develop the same collegial bond with students at other sites that they did with their local classmates, which would discourage cross-site communication. Second, the students did not seem to feel any pressing need for or benefit from this sort of communication. Designing the course so that the web site and E-mail reflector had to be used more often would have helped to minimize this problem to some extent.

Offering the course simultaneously at four universities also raised practical problems such as incompatibilities between quarter and semester schedules, complications in assigning credit, and difficulties in coordinating reserve materials at the libraries. Ideally, local distribution of class materials would be provided by the library systems. But this task is complex and has not yet been fully organized, which is frustrating for the instructors and students alike. These difficulties will be resolved as coordination among the universities continues. A training session or "how-to book" with the minimally needed information about organizing and teaching an interactive video course would be a great resource. The goal of this book should be to allow the instructors to walk into a

video classroom and concentrate more on pedagogy than technology. A more general training session for participants would probably help ease the transition to a video classroom. As it was, we learned the technology on our own in some summer pilot sessions and the fall seminar series. Universities are aware of these issues. Martie Parsley, a graduate student at Ohio State University is working to provide distance education resources on-line. These training materials are important to accommodate interested novices and to encourage others.

Surprisingly, the technical difficulties, such as dropped video connections or distorted audio were not major issues. The technical difficulties decreased over time and the participants got more comfortable, and as a result, more patient when problems did occur. The room arrangements varied a great deal from site to site. Close-ups of people, in contrast to long room shots, were better (although this required more attention from the participants at some sites who served as camera operators). It was difficult to establish a rapport with a person whose face was so fuzzy that one could not establish eye contact. The costs of multi-point video sessions are dropping and most universities have the needed facilities. However, costs should not be overlooked. The 1995-96 project was a success due to the funding support of the CIC, universities, and departments involved. The approximate cost was \$200 per hour for the use of the facilities and connect charges. These charges continue to drop as the technology becomes more common and improves.

In sum, more use of supportive technology, including electronic office hours, a secure web site, and E-mail reflector for a discussion group, will go a long way toward eliminating most of the disadvantages discovered from the multi-site interactive video project.

As innovators in research as well as teaching, we must utilize resources that through their technological sophistication, may solve logistics problems that face political science departments today. Given the large scale of cooperation and funding necessary for such a project, it will not replace the traditional seminar. But, multi-site interactive video is a resource which may allow advanced methods classes to be offered which otherwise would not be offered. The speaker series was offered again in the fall of 1996 and is scheduled for the fall of 1997. The next course, maximum likelihood estimation, is planned for spring 1997 and will be taught by Charles Franklin, University of Wisconsin.

Primary Advantages and Disadvantages from Various Perspectives

Every student Sutton (1997) interviewed was asked to summarize what he or she thought were the primary advantages and disadvantages of interactive, distance education. We are happy to report that the advantages outnumbered the disadvantages. "Most students' attitudes were pragmatic: Although they acknowledged the various problems with the mechanics of the course, their interest in the subject provided more than enough motivation to make the necessary adjustments in order to gain access to its content and they felt the course would improve with age" (Sutton 1997, 4). From an instructor's perspective and that of a participant in the speaker's seminars, high motivation seems to be a key element in the success of multi-site interactive video seminars. Teaching an audience with little motivation through this medium, such as an undergraduate required course, would probably be unbearable for all involved. In short,

unmotivated participants would not put up with the technological glitches.

Administrator Perspective - W. Phillips Shively, Provost for Arts, Sciences, and Engineering at the University of Minnesota

I unfortunately did not have as much contact with the course as I had hoped to have. As a political scientist myself, I had even entertained the vain hope that I might be able to participate myself, but the pressure of time made that impossible. Therefore, my comments are more in the abstract -- why I chose to support the experiment, and to continue it into the current year.

Collaboration of this sort offers the opportunity to build very strong programs that would otherwise be impossible for any one school to provide. In political data analysis, for instance, if we could harness the resources of the entire Big 10 -- or even just add Michigan to the four current participants -- we would have a research and instructional group unmatched anywhere in the world. There would not even be any close rivals. Further, the instructional program for graduate students could be offered much more efficiently, freeing up the faculty for other courses. Thus, if the transaction costs of a course like this can be made sufficiently low, we can simultaneously achieve terrific quality and save some resources.

It is essential, if the strategy presented above is to work, that the people involved form a real research community, not just a group exchanging courses. I think the "brown-bag" component, plus occasional face-to-face meetings, are essential.

Administrator Perspective - Brett Sutton, CIC evaluator

This course was of great interest to the CIC as an experiment in the delivery of multi-institutional instruction. The collaborative approach to higher education exemplified by this seminar is one of the goals of the CIC Learning Technology Initiative, a program endorsed by the CIC provosts to support the cooperative development and use of advanced instructional technologies within the consortium. A major purpose of this program is to identify the most effective mechanisms for extending the instructional resources and faculty expertise of the CIC universities. The time series course offered to administrators an opportunity to experiment with compressed video as a classroom technology, to learn more about how instructors and students adapt to this approach, and to begin to assemble evaluation data that will be useful to faculty innovators who plan similar projects in the future. Offered in an experimental setting that facilitated the development of realistic solutions to the technical and administrative aspects of distance education, this course is useful and interesting quite apart from its instructional success.

Perhaps one of the more positive outcomes of this experiment is the distinction the students made between the value of the course and their recognition of the ways the organization and delivery of the course could be improved. The ability of the seminar to satisfy an educational need—making available to students a graduate seminar that they would ordinarily have little or no access to—is significant. This suggests that it is worth making the effort to provide better distribution of class materials, to deploy the right kind of supporting technologies, and to develop better strategies for encouraging communication, particularly when most of these problems can be

addressed with currently available technologies. An unanswered question is whether this instructional approach can be made more cost-effective, so that it might be offered on a larger scale. But with the prospect of higher-bandwidth digital links between the CIC universities and the development of improved forms of multimedia conferencing, the prospects are good. The continuing willingness of faculty to embark on these experiments, and the similar willingness of administrators to pay for them, also is a contributor to the success of the Learning Technology Initiative.

Faculty Perspective - Janet Box-Steffensmeier, Ohio State University

The speaker series was a major payoff of the 1995-96 project for faculty. It contributed to professional development and community building by providing the opportunity to hear top presentations in political methodology and to interact with a broader set of colleagues on a more regular basis. Cost could be seen as a negative. But if distributed on a regular basis to all four universities, any one university would participate in four times as many seminars, and, when other universities are hosting, some costs are saved.

The best aspects of the time series analysis course for me was to teach with an exceptional scholar and teacher, John Freeman, and to work with some of the best students at four CIC universities. The biggest negative was the greater time commitment, which included learning to use the technology, more grading, and various logistical matters.

Faculty and Project Coordinator Perspective - John Freeman, University of Minnesota

The opportunity to build and solidify a network of scholars was most welcome. The ability essentially to continue the Methodology Section's Summer Meeting in the fall was something many of us had talked about, but until now never realized. Teaching with Janet Box-Steffensmeier was very satisfying. Her perspective on various time series issues was most enlightening. The students were stimulating as well. They asked many fine questions and produced interesting time series analyses of political problems. For these reasons, I found the experience quite rewarding.

Among the areas for improvement are the technology. Discussion and fruitful exchange of ideas will occur faster and more fully once we have the ability to observe all sites simultaneously, and to ask questions in a more orderly fashion. In turn, the quality of the seminar will improve.

One final comment, while this course allows one to "reach" a large number of students and to develop professional relationships with them, the pedagogical challenge is the same as in any course. The need for one-on-one exchanges with students -- dialogue and thorough, critical evaluations of their projects -- is still present. Only the medium through which this dialogue and evaluation occurs, in part, changes.

Student Perspective - Kathy Powers, Ohio State University

The key advantages that this medium brought to the classroom, in my opinion, were access to methods classes that may not have been otherwise available and access to leading scholars in the field of methodology. The opportunity to gain presentation experience as well as experience in

fielding comments through the student-led discussions was also very valuable.

The most significant disadvantages were the lack of efficiency in coordinating information at remote sites, large class size and the difficulty in facilitating discussion in this format. These classes demand a great deal of work on the part of the instructor as well as the student. Instructors must dedicate more time to class preparation than in a traditional seminar while students must take more initiative to seek help. Overall, the disadvantages can probably be alleviated by utilizing technology that can facilitate interactive communication between students and instructors at off-sites.

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Brett Sutton has held academic positions in anthropology and library and information science. His research and teaching experience spans a number of areas, including sociolinguistics, literacy, qualitative research methods, information technology, the sociology of science, and organizational planning. Recent publications on these subjects have appeared in *Library Quarterly*, *The Encyclopedia of Library History*, and *Public Library Planning: Case Studies for Management*. He currently holds the position of coordinator of the CIC Learning Technology Initiative.

Table 1

Students' Most Frequent Likes and Dislikes
(in order of frequency)

LIKES

- Access to instruction not otherwise available
- Opportunity to work with highly regarded faculty
- Graduate programs strengthened by access to expertise from other institutions
- Interplay of team teaching, which broadened the course substantively and methodologically
- Diversity of the participants from each site and an enhanced sense of professional community

DISLIKES

- Mechanics and communication mechanisms, primarily the lower levels of interaction
- Occasionally insufficient support for students at sites without instructors
- Bureaucratic problems of registration and course credit

Source: Sutton (1997).