

Distance Learning in Advanced Methods Training

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Prepared for presentation at the annual meeting of the Midwest Political Science Association, Chicago, 2001.

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This is a report on teaching advanced methods through distance learning and interactive video. The focus will be on a dimensional analysis course taught through this technology, illustrating some of the advantages and potential problems in this instructional mode.

The CIC Distance Learning Program

A few years ago the political science departments at four large midwestern universities starting teaching some of their advanced graduate-level methods courses through distance learning and interactive video (see Box-Steffensmeier, Freeman, Powers, Shively, and Sutton, 1997). The collaboration involves the Ohio State University, the University of Illinois, the University of Minnesota, and the University of Wisconsin, with initial funding from the Committee on Inter-university Cooperation (CIC) composed of the Big Ten Universities and the University of Chicago.

The initial intention of the larger project has been described as "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" (Box-Steffensmeier, et al., 1997, p. 2). The courses that have been taught in this program on a semester-basis prior to 2000 include time series (jointly taught by Jan Box-Steffensmeier and John Freeman), maximum likelihood (by Charles Franklin) and event history analysis (by Jan Box-Steffensmeier).

The participating schools plan to start teaching a regular curriculum of seven-week methods modules in this way in fall 2001. The courses to be taught in 2001-2002 are

statistical computing (by Wendy Tam Cho), time series analysis (one module by John Freeman followed by a module by Jan Box-Steffensmeier) and Bayesian methods (two modules by Charles Franklin). When the program is fully up and running, eight seven-week modules will be offered each year, two the first half of each semester and two the second half of each semester. This program will then provide a fuller menu of courses than any single institution could be expected to offer on its own, while at the same time pooling students so that each course would have enough students to justify its teaching.

The Technology of the Course

The dimensional analysis class was solo-taught at Ohio State, in a classroom which was set up for teleconferencing. Students went to similar rooms at the other three schools, and watched the class sessions on TV screens as they were held (except for one student at a remote site who watched videotapes of class sessions because of a time conflict with another of her classes). Students sat in front of voice-activated microphones; when they asked questions, the cameras immediately went to them. Thus students could ask questions and the instructor could answer them in real time. The actual technology was through T-1 phone lines, in which there is a very slight delay each time a microphone is activated at a different school.

The teleconferencing worked quite well. When the first political science methods course was taught in this way, several long losses of contact between the schools were experienced. Such dropped video connections occurred only twice in this course. Unfortunately, one occurred during the first class session, making the instructor more wary of the medium than proved necessary.

The instructional room was set up so that the instructor had to remain stationary in a chair at a desk with notes in front of him. Instead of a blackboard, there was a horizontal document display device with a camera focused on it from above. The TV screens would then show what was placed on the document display. Printed pages could

be placed on it, or the instructor could write out material on blank pieces of paper. The instructor often brought in printed outlines to display; other times he worked through proofs on it. Since the course covered many spatial techniques, spatial solutions, equations, and computer output were often also often displayed in this manner. This device allowed the instructor to provide written information spontaneously, but the instructor prepared more display materials in advance than he would have if he were in the same room as all the students.

Class Sessions

The class sessions involved a combination of different learning modes. The instructor lectured on material, asking frequently for questions. Examples of computer results from each technique were distributed before class sessions and were considered near the end of the class sessions. And output from homework assignments was gone through systematically in class. Thus the class combined lecture and practicum experiences, mathematical presentations with computer instructions and analysis of output.

Class discussion was rare. In part, this is because students are not used to discussion in methods classes. Many political science topics can be debated, but, after all, how can OLS assumptions be debated? The best free-ranging discussion occurred as part of the consideration of the advantages and disadvantages of oblique rotation versus orthogonal rotation, but that was atypical. One student who had extensive experience with the techniques in the course often participated in class, but most of the other students did not participate. Indeed, the students with the least background were probably most intimidated by the distance learning approach and asked fewer questions than they might otherwise.

Course Assignments

The students were given homework assignments on each technique, due before the next class session. Those homework assignments were then gone through together at the next class session, with the instructor showing how he would interpret the results. The homework was submitted electronically, and the instructor graded that homework, made comments on it in the "track changes" mode in Microsoft Word, and then sent them back to the students.

Additionally, the students were required to submit a term paper using at least one of the techniques considered in the course, and preferably comparing at least two of the techniques on the same set of data. This assignment worked well, even though there was less time for the students to work on it than in a longer course. The instructor sent detailed comments back to the students on their analyses. Student presentations of their results in class would be useful in a longer course.

The final exam was distributed electronically the last day of class. This take-home final consisted of definition questions and essay questions. The answers were submitted electronically, graded, and then returned to the students.

The Use of WebCT

It is important in this type of instruction that students at each installation have equal access to course materials. Therefore materials for the class were placed on the Web, using the WebCT program. (WebCT was chosen because it could be used without cost under Ohio State University's site license arrangement.) The instructor put the course syllabus up, along with notes on topics, handouts, assignments, and data to analyze. The notes from which the instructor talked were posted on the Web after some of the lectures. Preliminary drafts of book chapters written by the instructor on specific techniques were also posted.

One of the students at one of the remote sites commented favorably on the use of the Web in the course. He pointed out that more material was made available to him this way than was made available in the regular methods courses he had taken previously.

WebCT provided a good base for the distance learning experiment. However, the learning materials on how to post material on WebCT are not strong, so it took a while to figure out how to put some of the material up for the students. A few features never worked in the way the instructor expected. In particular, the survey of satisfaction with the class proved totally inoperable.

Student use of the WebCT material inevitably varied. The instructor occasionally checked whether students had accessed the materials and prompted those who had not made use of the materials to do so. Still there were marked differences between students, some making extensive use of the materials and others checking it only a handful of times.

Interaction with Students

There is also the problem of how to facilitate interaction between the instructor and students at remote sites. Three approaches were taken in this course. First, students could email questions to the instructor. Second, the instructor held interactive office hours in a WebCT chat room in the evening some weeks. Third, the instructor decided to visit two of the sites where he happened to have family, and he met the students at those sites and talked with them for a few hours.

The visits to the remote sites turned out to be the most effective way to meet the students at those installations. Very few questions were emailed to the instructor. The interactive office hours were a good way for the instructor and students to meet each other, with the topics ranging from asking questions about course materials and course procedures to talking about the political campaign and the presidential debates and asking the students more about themselves. However, only a few students took advantage of the

interactive office hours. The site visits allowed more extended interaction, including specific focus on the class projects that each student had chosen.

The instructor also appreciated the site visits. They allowed him to meet the students, rather than treating them as just faces on a TV screen or as people who appear in a chat room. Talking to 3-4 students at each site for 2-3 hours made the experience of teaching the course much more enjoyable.

Ironically, the students at Ohio State had less time with the instructor than those at those two remote sites did. Only a few of the local-site students stopped by in his office for questions. It was as if the instructional mode increased the barriers for contacting the instructor at the home site, while efforts were being made to facilitate such contacts for the other sites. This was just the opposite of the experience in the previous distance learning methods courses, where students at the remote sites were less satisfied with the instructional mode (Box-Steffensmeier, et al., 1997, p. 4). The visits to the remote sites apparently helped in that regard, but may have unintentionally taken away from the time that the instructor could spend with students at the home site.

Interaction among Students

One element that was largely missing in this class was interaction among the students from different schools. Students could see each other on the television screens, and a few students who participated extensively became known to students at other schools, but the interaction between students was less than occurs in most classes. Students were encouraged to provide pictures of themselves along with short biographies to be put up on the class's WebCT page. The instructor made use of this material to learn about the students he did not know, but it is not clear whether students used this to learn about their fellow participants. The large differences in numbers of students at the different sites (a dozen participants at the instructor's home institution, compared to three-

to-four at each of the other schools) also created an imbalance that made such interactions more difficult.

There are several possible ways to increase the interaction among the students at different sites. There will be a get together for students in the program this year at the Midwest Political Science Association meetings in Chicago, and similar get-togethers will probably occur at APSA meetings as well. It is possible to have students post their class papers on WebCT where students can read and comment on each other's work. A threaded discussion list can be used for students to answer each others' questions; this procedure worked well in the event history class, though students in the dimensional class did not take advantage of this opportunity. Joint presentation of assignments and/or readings by students at different schools could be set up; oral reports by students were not included in the dimensional class because of the shortness of the term, but this could be a valuable addition to a two-module sequence.

The Length of the Course

The course was a course in Scaling and Dimensional Analysis that I have taught, off and on, since the late 1960s. I have taught this course in several formats, from a 14-week trimester at the University of Michigan to a 4-week intensive course in the ICPSR summer program, to a 10-week quarter course at Ohio State University. Each of those formats involved approximately 40 hours of instruction.

By contrast, the distance learning course was taught only 7 weeks for 2 hours per week. The four schools decided on 7-week modules for several reasons. The schools are on different academic calendars, three now being on semesters and one still being on quarters. The starting and ending dates are different even for the schools on the semester system. The 7-week module permits flexibility on scheduling across these different situations. Second, the 7-week module gives the instructor some incentives for participating in this form of instruction. After all, this format increases the number of

students the instructor will have, increases the grading burden, requires getting material ready in advance more than for a usual course, requires putting material up on the Web, and so on. The shorter course is one way to give the instructor incentives to put up with these higher costs. In practice, the amount of work involved for the instructor for the module is probably about the same as required for a full-term course.

Obviously the shorter course necessitated a considerable cutting of material. This can obviously be a disadvantage, but it can also be an advantage. For one thing, it forces greater care in the choice of topics than is usually the case. There are a large number of scaling techniques that could be considered in a course, so the shorter course forces the instructor to choose which really are the important techniques. I actually felt very comfortable with that choice, and made sure to emphasize the techniques that I considered more important for students to learn. Second, the shorter amount of class time makes it important to be able to provide material in a variety of other formats. In this case, supplementary material was made available on the Web. When there was not enough time to cover a particular proof, for example, it could be put up on the Web for students to examine. One useful change would be for the instructor to emphasize more at the beginning of the module that only an introduction to the techniques can be provided within a 7-week period, encouraging the students to take more courses in the area if they want to cover more material. Another alternative would be to have a pair of 7-week modules on the topic, as will be done in the 2001-2002 academic year for Bayesian methods and for time series analysis.

The Effectiveness of the Course

It is difficult to gauge the effectiveness of the course because the WebCT course survey did not work, but the open-ended comments about the course on the OSU course evaluation form are instructive. Answers about what was best about the course included handouts, lecture, examples, integration of theory and practice, the interesting subject

matter, the quick exposure to a wide variety of methods, the practical information, and the practicum experience. When asked what they would change about the course, students focused on three main themes: course length, course content, and instructional mode. Four students wanted the course to last longer, to cover topics in more depth and to be able to go through the math slower. Two students wanted different topic coverage, with more attention to confirmatory techniques. Two students complained specifically that "the distance learning aspect greatly hampered the educational environment" and that "the webcast format was not conducive to interaction and learning."

It is reasonable to expect that the reactions will be different for students who were at the main site and students at the remote sites. A few students at the other schools later replied to the open-ended questions described above. Their suggestions about how to change the course are informative. One wrote: "Longer semester and shorter but more frequent class sessions." Another wrote, "It would be fun to interact with other students at other campuses – perhaps there's a way to provide a platform for sharing our research and giving / getting feedback." These students seem to be less concerned with the disadvantages of the distance learning approach than the home institution students were. Indeed, one wrote that the class was "truly enjoyable, despite the satellite hookup" and recognized that the technology permitted the teaching of a course "which is rarely taught anymore." However, the concern with course length was evident in these comments as well those by students at the local institution, and the comment about the lack of interaction among students emphasizes a problem that the local students did not recognize.

Summary

In the end, the instructor enjoyed the course more than the typical course because of the interaction with the students at the other sites, but found the lack of interaction at the home site frustrating. The initial nervousness about being on television soon faded. It

was fun to see what possibilities the technology offered. Yet it is unfortunate when many of the students at the home site feel they have lost something in the process. The need to balance the students at the home site with those at the remote site and the need to develop modes of interaction among the students provide important challenges for this mode of instruction. Given how valuable the meetings with groups of 3-4 students at the remote sites were, instructors in the future might consider similar meetings outside of class time with small groups of students at the home site to discuss their planned course projects together.

Finally, it is important to emphasize that there were two simultaneous aspects of the course that affected the instruction: the effect of the short module and the effect of the distance learning, as well as possible interaction effects with the short module exacerbating the problems raised by distance learning. The challenge for the new CIC distance learning program will be to minimize the problems created by both the short module and distance learning, while creating an effective learning environment for the students. As pointed out above, having two-module sequences would at least alleviate the effect of the short module. In any case, the technology is both exciting and challenging, providing a novel instructional mode that is fascinating to try.

References

Box-Steffensmeier, Janet M., John Freeman, Kathy Powers, W. Phillips Shively, and Brett Sutton. 1997. "The Multi-site Interactive Video Curriculum in Advanced Data Analysis for Political Science. *The Political Methodologist*, vol. 8, number 1, pp. 2-8.