Distance Learning: Things to be Aware of or Wary of
When Combining a Resident Course With a Distance Learning Course

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Abstract

The University of Dayton recently entered into a 2 + 2 matriculation agreement with Edison Community College located in Piqua, Ohio. Students in the program will complete their Associates Degree requirements at Edison before transferring to The University of Dayton to finish their Bachelors Degree in Engineering Technology. Since the distance between the two institutions requires at least a forty-five minute commute, all of The University of Dayton Engineering Technology courses completed by Edison students will be offered through distance learning.

Nearly all of the Edison Community College students participating in the 2 + 2 program work full-time. This fact, combined with the distance separating the two institutions make providing a cohesive educational experience similar to that of resident students at The University of Dayton challenging. Distance learning capabilities at both institutions make such an endeavor possible.

During the Fall semester of 2002, the Industrial Engineering Technology program at The University of Dayton offered the IET 323 Project Management course as a resident on-campus course. The same course was offered to students at Edison Community College as a distance-learning course. These two courses were actually delivered as one course, taught from 7:10 at 8:25 p.m., Monday and Wednesday evenings by the same professor. Technologically enhanced classrooms at both institutions allowed the courses to be offered at the same time. The simultaneous participation of the students at Edison Community College at a distance with the physically present students and professor on the University of Dayton campus was made possible through video teleconferencing.

Over the Summer and Fall, during the preparation of the course and the actual delivery of the course, the faculty at The University of Dayton learned a lot about what to be aware of when offering simultaneous resident and distance learning courses. They also learned what aspects of teaching such a course to be wary of. This paper has been developed to provide others with insight into how to properly prepare for a combined resident and distance-learning course. The paper will discuss things to be aware of including what it is like to be in-class and on-screen simultaneously, how to deal with class size and class composition issues, and communication issues. This paper also discusses some serious considerations for faculty to be wary of including workload issues, project and presentation complexities, and the reactions of guest lecturers.

Introduction

In order to provide more educational opportunities for individuals living great distances from the university, in April of 2002, the University of Dayton entered into a matriculation agreement with Edison Community College. Students graduate with an Associate degree in Engineering Technology from Edison and then complete the requirements for the Bachelor of Science in Engineering Technology at the University of Dayton. To bridge the 45-minute commuting distance between Dayton and Piqua, Ohio, Edison students will complete distance-learning courses offered by The University of Dayton. In order to accommodate the large number of Edison students who work full time, the program is laid out so that they should be able to complete the required courses on a part-time basis in the evening, over a four-year period of time.

Distance-learning provides educational opportunities for students in remote areas, opportunities that otherwise, wouldn't be available. A University of South Florida study indicates that the delivery medium does not negatively impact the transfer of knowledge. The study states that with an effort on the part of the teacher, the disadvantages of the lack of face-to-face interaction can be overcome using new technologies[2]. At The University of Dayton, the distance-learning classroom is equipped with a Polycom video-conferencing system with two cameras, a SMART Board, SMART panel, projector, document camera, VCR, and six speakers mounted throughout the classroom. The instructor can view the students at the distance location on a 32" monitor. Two speakers transmit audio from the distance students to the instructor's classroom. One of the advantages of using the SMART Board technology is that the professor can write on the SMART Board using electronic ink in a variety of colors. The electronic pen can write over PowerPoint and document camera images as easily as writing on a chalkboard. These images can be simultaneously viewed by both resident and distance students. Annotations can be saved to the computer and reviewed, edited, and printed with the additions and comments. The cost of the SMART Board system, including the projector and VCR was approximately $15,000. The cost of the distance learning equipment was approximately $31,000. The layout of the distance-learning classroom at The University of Dayton is shown in Figure 1. The classroom at Edison is equipped similarly. The technological setup enables the Edison students to see and hear the instructor and resident students real-time. This environment is closer to a traditional classroom setting than a distance-learning experience provided over the Internet or with videotaped lectures.

The first two distance-learning courses, IET 323, Project Management, and MFG 240, Manufacturing Design, were delivered during the Fall semester of 2002. Each of the courses were taught at The University of Dayton to a group of resident students and simultaneously relayed to the students in the Edison classroom.

Things to be Aware of and Wary of: Class Size and Composition

Teaching a resident class and a distance class simultaneously means that you have the issues associated with teaching one large class as well as the issues associated with teaching two classes at once. The distance-learning students at Edison are primarily non-traditional, part-time students who are working in full-time jobs. Some even have job titles that include the word 'engineer'. Contrast this with the resident students who are mostly traditional full-time students with little or no job experience outside of cooperative education jobs or internships. To make the course consistently interesting to all parties, class materials and discussions must take into account this mix. Careful preparation must go into designing and developing course materials that bridge this gap. Enhancements to topic coverage included the use of a variety of applicable current event news articles, speakers from industry, and examples of project proposals and plans from industry.

The extra preparation time required increases the workload associated with this type of course. Greater care was needed when preparing and communicating assignments. The course acquired greater structure with each day carefully planned in order to ensure that the necessary material was available on the web in a timely fashion. The workload associated with teaching a course simultaneously to resident and distance-learning students is greater than the workload of teaching two resident sections of the same course. Because of the new technology, preparation and set-up time increased. To help alleviate this workload crunch, a credit of two courses was given for teaching the distance courses.

Things to be Aware of and Wary of: Being In-class and On-screen Simultaneously

One of the chief goals while teaching these distance courses was the desire to ensure that students in both sections received the same experience. Having half the class on TV required some getting used to. There were occasions when both groups of students felt they were not receiving a quality experience. There were two critical reasons why this was true. The location of the distance-learning TV monitor at the rear of the room became the major focal point for the instructors and guest lecturers. The eyes of all speakers tended to be drawn to the monitor at the expense of the resident students who were physically present in class. There was also a tendency for the speakers to speak in a louder voice than necessary. The lack of eye contact with resident students was improved by making a conscious effort to scan all the students while lecturing and including the screen in the scan. Feedback from students, both near and far, enabled the speakers to modulate their voice to avoid unnecessary volume.

A second problem facing the resident students was technical difficulties. Since the Polycom video-conferencing system was the first of its kind to be installed at The

University of Dayton, occasionally, it was necessary for the instructor to stop teaching while the problem was being rectified. This was done to make sure that nothing was being taught to the resident students that the distance-learning students might miss. Some resident students felt that the class should have continued even though the distance-learning students could not participate.

The third problem affected the distance-learning students. Because the monitor was in the back of the classroom, the instructors and guest speakers could not clearly see the faces enough to discern who was talking at the distance site. To rectify this problem, students became accustomed to identifying themselves when they made comments or asked questions.

The fourth problem was the effect of a distance-learning situation on guest speakers. As previously mentioned, the speakers had to be aware of the need to modulate their voice and to not become focused solely on the TV monitor. Guest speakers also needed help with the new technologies present in the classroom. After issuing several invitations, it became apparent that speakers, knowing that they were going to be on camera, may not readily accept the invitation to speak.

A fifth problem was primarily associated with the sound system at the beginning of the term. It took several changes to microphone placement as well as adjustments to the volume to eliminate feedback difficulties. Speaker telephones at both locations were used as an interim fix.

Things to be Aware of and Wary of: Access to the Instructor

Ensuring student access to the instructor is critical for the success of any class, but it is particularly important in a distance-learning experience. Interestingly, due to the technological capabilities of the instructor and students as well as the technological configuration of the classroom, the distance-learning students had virtually the same access to the instructor as resident students. Students and instructors communicated via video teleconferencing, email, telephone, and fax. With the technology in the classrooms, distance students can ask questions during the class on a real-time basis along with the resident students. Following each class, time was allotted to answer any general questions that either the distance or resident students may have had on course material or other issues. During exams, which were given simultaneously to resident and distance students, the instructor traveled to the distance location while an instructor from The University of Dayton monitored the exams at the resident classroom. The link between the two classrooms was maintained in case either group had questions. The instructors also traveled to the distance site when oral presentations were being given by the distance students. This was possible due to the relatively short distance. Future plans are in place to have a technician available at the distance location to proctor exams and to facilitate laboratory exercises.

Things to be Aware of and Wary of: Access to Course Materials

All facets of the courses must be convenient to the distance-learning students. Edison students did not have to travel to The University of Dayton. Textbooks can be purchased on-line from the university bookstore. Websites were set up on Lotus Learning Space allowing both distance and resident students to download course materials including the syllabus, copies of lecture notes on PowerPoint slides, assignments, handouts, course grades, etc. This system of disseminating information worked very well and was readily accepted by the students. One drawback of the current software that we are using is that the instructor can not load material on the website when students are logged on. It was very time-consuming for the instructor to continually log on to the system to find a time when no students were also logged on in order to upload course materials. The University of Dayton Information Technology department is currently researching different software in order to eliminate this problem in the future.

Things to be Aware of and Wary: Submitting Assignments

Initially, there were 51 students, 33 in the resident section and 18 in the distance section. Forty-seven students completed the course. With such a large class, submitting assignments became more difficult. At first, since the distance-learning students were asked to submit assignments by email, all students were instructed to do so. This meant for every assignment, there were 50 or more emails for the instructor to download and printout. It soon became apparent that this was not a good idea. This policy was changed to require only the distance-learning students to submit assignments by email. In the future, thought will need to be given as to the optimal class size for such an endeavor.

Future Plans

During the Winter term of 2003, two more distance-learning courses are being offered in the evenings. Plans are to provide four courses in the Fall of 2003 and then eight courses each semester after that.

One concern about the Polycom system is its notebook capability. While these blank pages are handy for working problems on the SMART Board screen, for courses that are more analytical there won't be enough space to solve and show the entire problem solution at one time. A system that allows writing on a conventional white board to be transmitted to a computer is being considered. As our familiarity with Lotus Learning Space capabilities increases, we see this tool becoming a greater part of the course in the future. We are considering implementing a chat room system called Sametime to be used for office hours and discussion groups. In the future we plan to use Quickplace's document sharing capabilities to enable team members to work online, thus enabling a better mix of distance and resident learning students during project or team activities.

Conclusions

The main benefit of the distance-learning program to The University of Dayton is, of course, increased enrollment. The first two courses provided an additional 21 students. Another significant benefit is the educational opportunities distance-learning allows for students in remote areas. These opportunities would otherwise not be available. Our experiences these two semesters have shown that the quality of the courses provided to distance-learning students is essentially the same as that provided to resident students. As the University of South Florida study indicates, the delivery medium does not have to negatively impact the transfer of knowledge. As the study says, with an effort on the part of the instructor, the disadvantages of the lack of face-to-face interaction can be overcome using new technologies. By making adjustments based on what we learned through experience, we were able to meet our goal of designing this program to provide the same experience for the distance-learning students as the resident students.

Bibliography

1. Bernecker, C. A., Vincent, W. and Kumar N. "Distance Learning in Architectural Engineering: An Inter-Institutional Case Study", ASEE Annual Conference, Session 3206, 2001.
2. Callahan, A. L., Givens, P. E. and Bly, R. G. "Distance Education Moves into the 21stCentury: A Comparison of Delivery Methods", ASEE Annual Conference, Session 2542, 2001.
3. Kumar, S., Walker, J., Jalkio, J. A. and Rehn, R. A. "Distance Learning, an Enabling Approach in Academia/Industry Partnerships", ASEE Annual Conference, Session 2522, 2001.
4. Richardson, C. "Distance Learning Courses at Rochester Institute of Technology", ASEE Annual Conference, Session 1149, 2001.
5. Samples, J. W. "Distance Learning – Don't Forget the Pedagogy", ASEE Annual Conference, Session 2793, 2001.
6. Segalewitz, S. and Lepore, R. "Establishing a Partnership to Deliver Baccalaureate Engineering Technology Programs to Location-Bound Non-Traditional Students", ASEE Annual Conference, 2003.

Biography

Charlie P. Edmonson is an Associate Professor and Program Coordinator of Industrial Engineering Technology at the University of Dayton. Prior to joining the faculty at UD, he retired from the U. S. Air Force after 30 years of engineering design, industrial engineering, and experience at various levels of management.

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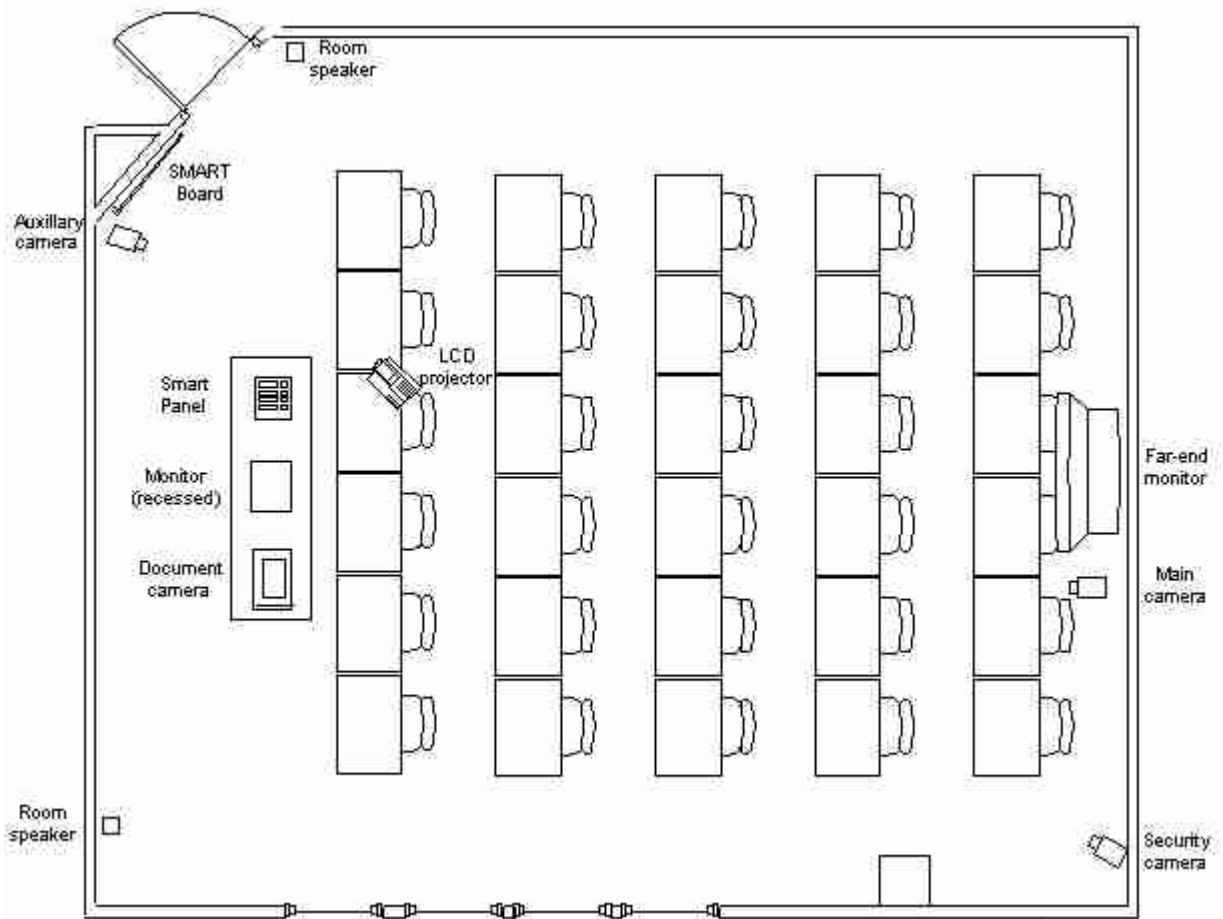
Figure 1. KL-305 Distance Learning Classroom