Developing "Civil Construction," An Internet Class using Electronic Blackboard

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Abstract

Since the summer intern experience for students in construction engineering and management technologies has become so important to them, most have not been able to enroll in on-site summer school classes. In the past students have taken such summer school classes in order to reduce their class load during the fall and spring semesters. The description of the process used to determine if interest in a summer, 2000, Internet course existed as well as which course would be offered will be reviewed. Further discussion will focus on the methods of delivery and their technical problems as they related to the implementation of the course work.

With the adoption of Electronic Blackboard at Pittsburg State University in the spring, 2000 semester, a foundation was established upon which to build an Internet-based course. The format of the course material for "Civil Construction" made it possible for twenty-two students to participate. Lessons learned as well as suggestions for implementation and improvement will be provided. Although numerous obstacles in the delivery of such a course occurred, the benefits far outweigh the difficulties. Reflection of the experiences in this prototype for the Department of Engineering Technology has resulted in an interest from other faculty in other departments who would like to introduce Electronic Blackboard in their classes.

Introduction

During the early part of the spring, 2000 semester, all construction students were surveyed to determine which courses, if any, they would be interested in taking over the Internet during the summer as an off-campus course. The top three choices of the Construction Engineering Technology and Construction Management students surveyed were civil construction, construction management, and estimating. It was decided that civil construction would be the course most adaptable to an Internet format. Civil Construction for the summer of 2000 was then added to the schedule.

At this time students were advised that the course would be provided as long as enrollment justified its offering. Because this would be a beta class, enrollment was limited to 20 students. The class closed the first day of advance registration. An additional 10 students were placed on a wait list. During a normal fall semester, typical enrollment in civil construction ranges from between 40 to 50 students.

Before the conclusion of the spring semester, each enrollee was required to participate in a one-hour, on-campus orientation, which was held in our computer lab. This session reviewed class format, procedures and equipment requirements. Because this orientation went well, we were all lulled into a sense of false security, for as soon as the students were in their own environments, many problems surfaced.

Development

The original format consisted of using Blackboard (1). Blackboard allowed for setting up all course documents, assignments, course assessment, class assignments, external links, class calendar, and student grades (Figure 1).
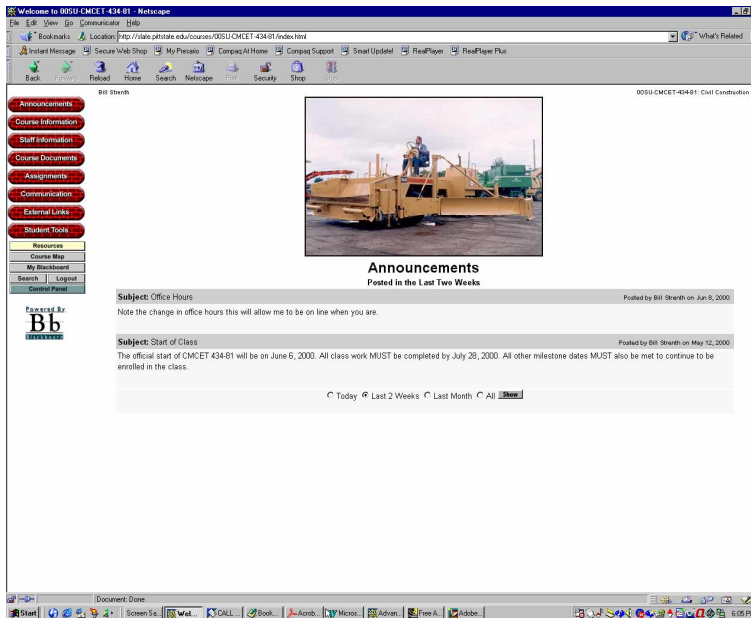

Figure 1

Course Page

The class was scheduled to begin June 6 and to end July 28. It would consist of four segments. Students were required to work on assignments, take the quiz, and complete the segment test by a designated date. They were permitted to work ahead of the schedule, but they were unable to work past any pre-determined deadline.

Course information was provided including course description, course goals, class syllabus, grading requirements, and test information (Figure 2).
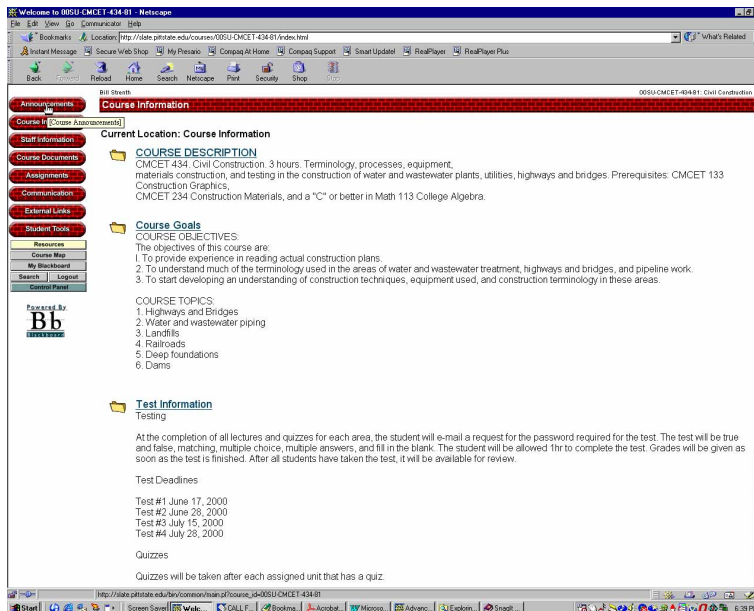
Figure 2

Course information page

A typical assignment (Figure 3) would consist of a PowerPoint presentation and Internet-linked reading assignments (Figure 4). Included in each segment was a virtual field trip. An example was the I-26 construction in Madison City, North Carolina(2). The website was an unofficial one for the I-26 project currently under construction. Students were required to view vicinity maps, photographs, and up-to-date information about the project. After viewing the photographs, students had to determine the processes and the equipment being used in each of the photographs. Reading assignments included articles from periodicals such as Engineering News Record (3) and Hot-Mix (4). Other links were to products, manufacturing, and Department of Transportations.
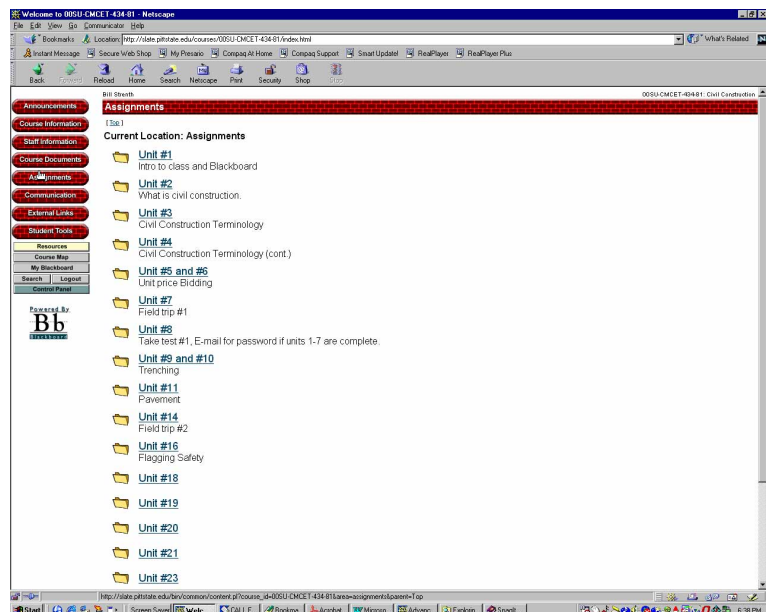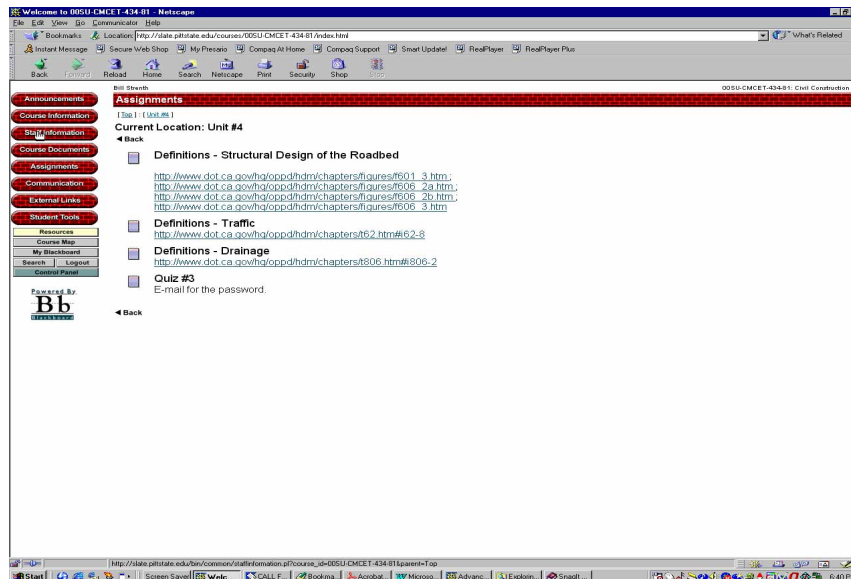

Figure 3
Assignment page

Figure 4

Reading Assignments for Unit #4

When a student completed a lecture for a segment, he/she would e-mail for a password in order to take the online quiz. Those timed quizzes consisted of matching, true-false, and multiple choice questions which were randomly-generated by Blackboard from a pool of questions previously written. After completing all lectures, assignments, and quizzes for a segment, students would again e-mail for the password which would allow them to access the segment test. All quizzes and tests were computer graded, and the student would receive immediate feedback in the form of a score. When all students had completed all quizzes and the test for a segment, each could revisit the quiz, see his/her initial answer, and also learn the correct answer as well as an explanation for it. A student drop box in which students would place their homework was also available.
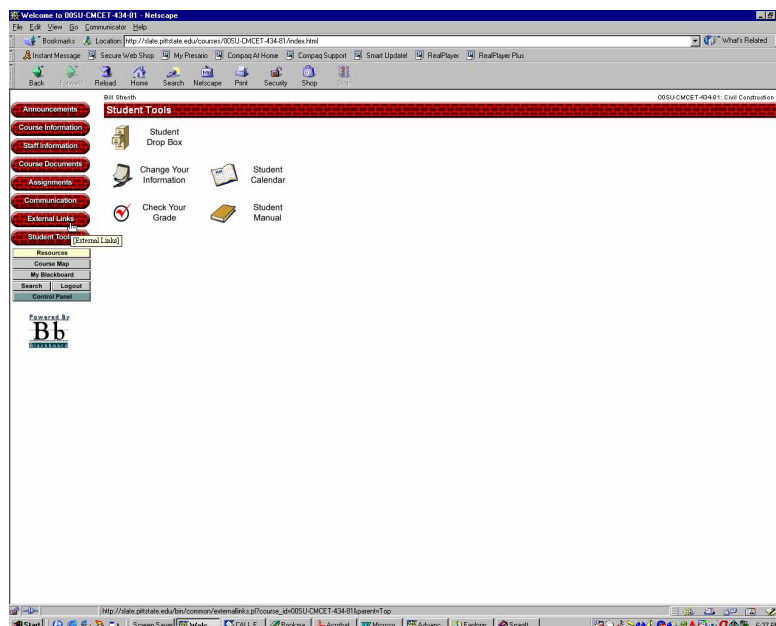

Figure 5
Problems

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Enrollees were in locations as far away as Alaska and as close as on-campus. When class started on June 6, twenty-two students were enrolled. The first problem surfaced on the first day when two students were unable to access Blackboard. Although we tried to resolve this problem through telephone and e-mail, they withdrew from the course. The second problem also occurred the first day when some students couldn't access PowerPoint through their home computer. Even though links for a PowerPoint document were supplied, some were unable to download and load the software provided. In order to try to work around the technical problem, the first lesson was saved as HTML. Blackboard requires that all individual slides be zipped into a single file to be downloaded on the student's computer. This required the unzipping of all the lecture files on the student's computer. Because some students didn't have software to unzip the file, the same problem occurred. The third method implemented for the first lecture was to save the PowerPoint presentation as a text file. All students were now finally able to review the first and second lectures.

The next major challenge was that the PowerPoint presentations having pictures and scanned drawings couldn't be saved as text files. Later, three more students withdrew because they lacked computer knowledge necessary to get the software to work.

Solution

Starting with the third lecture, many photographs and scanned drawings were required. This created large PowerPoint files that resulted in particularly long download times (3 hours), a totally unacceptable amount of time. This dilemma required a major change in original plans. Blackboard and PowerPoint alone would not be sufficient.

In order for students to download one page at a time, HTML files created with Hot Dog Pro would be used. As a result, students would have faster access, and they wouldn't have to start at the beginning each time as they had done with PowerPoint. In order for this to occur, all lectures previously completed had to be redone in HTML format and saved to the university's server. This method was successful and was continued throughout the rest of the session.

Time

Student usage and time were the greatest in the evenings between 6:00 p.m. and midnight (Figure 6) Friday, Saturday, and Sunday (Figure 7). The sixteen students who completed the course accessed trackable documents, lectures, reading assignments, quizzes, and tests a total of approximately 15,000 times over the eight-week session.

Hour of day

1am - 8am
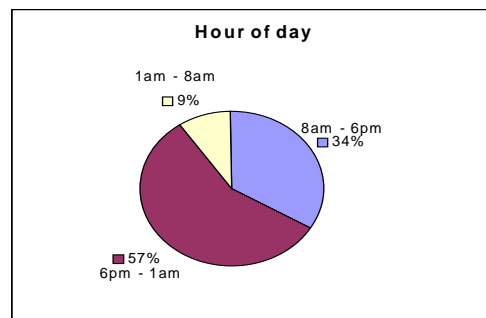9%

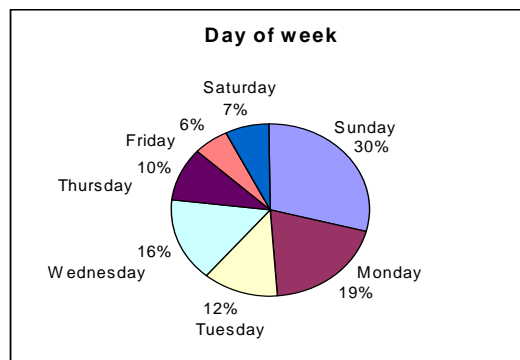8am - 6pm
34%

57%
6pm - 1am

Figure 6

Figure 7

Instructor time was multiplied many times over the original anticipated time because lectures had to fit a different format. It was also necessary to be online every evening from 7:00 p.m. until midnight to answer questions related to reading assignments, lectures, and/or computer problems. A total of approximately 1200 hours was committed to this task.

Conclusion

Student responses to this Internet class were varied. Those students who finished the assignments and coursework before the scheduled time were happy and satisfied and are already asking which course will be offered online during the summer, 2001 session. Some of the students who completed the assignments, quizzes, and tests at the last minute were not as enthusiastic. It is possible, too, that these students were more frustrated as a result of the delivery problems which seemed to be compounded by their own lack of self-discipline and commitment to the course. The majority of the students, however, have inquired about another summer Internet class.

When I was asked in the middle of the chaos of this summer class if I would be willing to do it again, I would reply, "Absolutely not!" However, after reflection and feedback from students, I would again be willing to instruct such a course. After having been through the problems of delivery once, they would not be new to me again. Several portions of this online class have been implemented in the current on-campus class, so there has been some benefit for this year's course as well.

Future

Since a foundation has been built for this class, the amount of time required to create and repeat this offering has been decreased. Improvements in method and content will be made as the university's intrastructure improves. Future online classes might include live stream video field trips, the introduction of virtual projects so that students would look at the drawings for a project and see the site of a project. They would then determine the constructibility of the tasks and view the actual construction of the task and compare their decisions with the reality.

For a course like this to be successful, all three parties, students, faculty, and administration, have to realize the commitments necessary on everyone's part for this to work. For faculty, the normal 8:00 a.m. to 3:30 p.m. teaching day at the university does not exist. For example, it was necessary for me to be online at home every evening and all day

Saturday and Sunday. For students, a common meeting time is imperative for online discussion and question/answer sessions. This could be difficult because of the different time zones that might be involved. For us, it meant that we had students in each of the five time zones.

References

1.	**Blackboard**	http://www.blackboard.com/
2.	**I-26 field trip**	http://users.vnet.net/lansford/a10/
3.	**ENR**	http://www.enr.com
4.	**HOT-MIX**	http://www.astecindustries.com/hotmix/
5.	**Hot Dog Pro**	http://www.sausage.com.au/default.php

Bibliography

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