

Why Aren't Course-Management Systems Penetrating Faster?

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Abstract

Course-management systems such as Blackboard and WebCT promise to enhance the on-line experience of students in face-to-face and distance education alike. Yet many course Web sites are put together without them—even those of technologically savvy “early adopters.” Often instructors continue to manage their Web sites with rudimentary tools. Is this because the systems are not user friendly, because they promote policies (such as access restrictions) the instructors are not comfortable with, or because the learning curve is too steep? Or is it because they are not promoted effectively by the schools that adopt them? This paper reports on a survey of 160 educators regarding their use or non-use of these systems, and their satisfaction with them. It looks for differences in the way they use the Web, compared to instructors who “roll their own” Web sites, and assesses how difficult it would be to take an existing course site and place it within a course-management system.

1. Introduction

Course-management systems* have been around for several years, and by now, almost all universities have adopted them. That was the easy part—the hard part is getting faculty to use their features. Anecdotal evidence and observation led the author to suspect that a lot of the usage of these systems is just token. To test this hypothesis, the author created a Web-based survey on this topic and announced it on several listservs, including the ASEE Engineering Technology listserv, the ACM Special Interest Group on Computer Science Education member listserv, and the NACADA Commission on Technology in Advising TECADV-L list. The survey was conducted in January and February 2003. One hundred ninety-seven responses were received. Most of them (174) were from the United States. Ten came from Canada and eight from Australia, with Israel contributing one and Taiwan two. Of the 197 responses, 67 came from instructors in some form of computing or computer science (many of whom are in colleges of engineering), and 64 came from other engineering instructors. Anonymous responses were allowed, but instructors were allowed to give their name and e-mail address for followup questions.

2. Ubiquitous systems

Out of the 197 respondents, 171 (or 87%) reported that their university had adopted a course-management system. Sixteen more reported that their department or college had adopted a CMS. Most of the rest didn't know whether their university had adopted a system. Just nine

* Course management systems are increasingly becoming known as “learning management systems,” reflecting the fact that they can be used in teaching outside regular credit courses.

respondents were sure that neither their university, college, nor department had adopted one. WebCT users outnumbered Blackboard users by a small margin (81 to 68). These were the only two systems listed on the survey; all others were write-in choices. The most frequently mentioned of these was Prometheus, developed by the University of Washington, but now sold to Blackboard, named by 4 respondents.[†] Of those answering the survey, 67% had used the CMS adopted by their institution; 23% hadn't, and the remaining 10% didn't answer the question.

Table 1. Penetration of Course-Management Systems

| | Yes | No | Don't know |
|--------------------------------------------------------|-----|----|------------|
| Has your university chosen a course-management system? | 171 | 10 | 12 |
| Have you used the system your institution has adopted? | 132 | 46 | |

3. Reasons for Non-Use

While a usage rate of 67% sounds high, this number may be deceiving. One would expect some self-selection bias; people who knew little about CMSs would not be likely to respond to the survey. In a survey on course Web sites for last year's ASEE conference [1], the author found that more than half of those (73 of 128) whose university had adopted a CMS had not actually used the CMS themselves. The survey suggested several reasons why one might not use a CMS (Table 2); the most common reason turned out to be lack of time to adopt one's existing Web pages. As an Engineering instructor from a state university in the West said,

"I've already spent innumerable hours developing my own web sites. Why go to the trouble of moving them just to get some cutest icons? I don't need the additional 'functionality.'"

Table 2. Reasons for Non-Use

| <i>Why haven't you used the CMS adopted by your institution?</i> | |
|-----------------------------------------------------------------------------------------------------------------------|----|
| It took too long to learn. | 4 |
| The university does not provide enough support. | 4 |
| I do not have enough material in computerized format. | 7 |
| I didn't have time to adapt my existing Web pages. | 12 |
| It would be too hard to take my site with me if I stopped using the system (e.g., if I moved to another institution). | 3 |

One theme that ran through several prose responses to the question was control—instructors wanted to organize the sites in their own way and to update them without going through the system. An Electrical Engineering instructor declared,

"I'm html and computer literate. I can publish material on the web and enter and analyze assignment grades faster and more flexibly directly, rather than going through the Blackboard system."

A Computer Scientist from a private university in the East added,

[†] A few respondents from North Carolina State University mentioned Wolfware, which isn't a full-fledged CMS; it consists of class mailing lists, an updated class roster, message boards and a homework-submission system.

“Since my existing web pages are so easy to use, I didn't see any reason to change over. I don't do anything that requires restricted access, and I don't do any online testing, so I don't see any benefit to using Blackboard. In addition, by sticking with my own pages I keep everything on our departmental server where I have total control over my materials.”

Some said that the systems were too hard to use, like this from a Computer Science and Engineering instructor:

“I post notes, etc., on the web. I have an email list for the class. It seemed to me that the only advantage I would get from Blackboard was in the presentation of the grade information to the students. Everything else would require me to do my usual web stuff PLUS an extra step in order to connect it into Blackboard. This seemed like a lot for relatively little return.”

A Construction and Civil Engineering Technology Instructor put it this way:

“Blackboard is too bulky, attempting to accomplish too many objectives, thereby requiring too much time for fluency for modest user.”

Another theme was access restrictions. Although both Blackboard and WebCT can reportedly be configured to make pages public [1], most systems are not set up to make this easy. The academic tradition is one of open access to published material, and many faculty want to keep it that way [2]. This is easiest if they avoid use of the CMS. Of the several respondents who mentioned this, a Computer Science instructor put it best:

“I prefer to keep my materials on an open site, not one that requires a password. That way, I can list my materials in CS resource listings (like Renee McCauley's), and point others to it without any formality. It's also easier for me not to move all my stuff to Prometheus - I was putting materials on the web years before any of these systems were developed.”

The closed nature of the systems came in for criticism in another way: It makes it hard to use other software to assist in management of a site. Another Computer Scientist said,

“The course material being public is hopefully an obvious idea. Incompatibility and slowness is again obvious. When preparing and posting course material I convert the documents from LaTeX (splitting then into multiple HTML pages too), and I also have a cron job that mirrors the whole thing. All of this is done automatically through a bunch of perl and shell scripts, whilst WebCT requires manual intervention to accomplish the same task.”

This respondent was one of four who complained about the slowness of CMSs.

A final reason for non-adoption is that the institution might change vendors, requiring faculty to redesign their sites. According to a Biology instructor,

“I'm an independent cuss and like total control over my web site. Also, our university for a time adopted Blackboard and then abandoned it for WebCT, leaving those faculty having adopted Blackboard high and dry. I learn what I have to do and depend on myself, not some committee that will determine what's good for the university without knowing what I want on my web site thank you.”

4. What Features do Faculty Use?

Some features of course-management systems duplicate facilities that pre-existed in other software; other features have been pioneered by the CMSs themselves. So it is not particularly surprising that some features are used much more widely inside the system, and some used more widely through other software.

Table 3. Usage of CMSs vs. Outside Software

| Which of the following features have you used through the course-management system or through other software? | Inside (through the CMS) | Outside (through other software) | Ratio of inside/outside |
|---------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------|-------------------------|
| E-mail to individual students | 90 | 154 | 0.58 |
| E-mail to class mailing list | 100 | 116 | 0.86 |
| Automatically updated class roster | 88 | 50 | 1.76 |
| Calendar of course assignments | 90 | 65 | 1.38 |
| Grade (mark) reporting to class | 96 | 65 | 1.48 |
| Lecture generation | 44 | 64 | 0.69 |
| Bulletin boards | 61 | 23 | 2.65 |
| Discussion groups | 66 | 18 | 3.67 |
| Web-based testing | 53 | 15 | 3.53 |
| Video | 7 | 14 | 0.50 |
| Audio | 11 | 11 | 1.00 |
| Chat rooms | 31 | 7 | 4.43 |
| <i>Total</i> | 737 | 602 | |

Numbers are boldfaced if they represent the more frequent use of the feature. For example, e-mail is used by many more instructors outside the system, whereas course-related chat-room usage is predominantly within CMSs.

The most commonly mentioned feature not in the above list was on-line assignment distribution and submission (an obvious oversight in the list). Most other features mentioned (Web links, past tests, product specifications, etc.) could be posted on an outside Web site just as easily if not easier; a CMS appears to hold little advantage for these materials. One item that was used outside a CMS is “automatically-generated class photo sheets.”

Perhaps more usage will come in time. One small-college Math and Computer Science instructor says it’s best to start small:

“I have found it best to get started by finding one or two things that are easier to do via WebCT (or whatever) then gradually build how you use it, instead of doing everything that’s possible. That’s what I recommend to those who are considering using our WebCT system.”

5. A Representative Sample?

The data reported above was derived from a self-selected sample of instructors (primarily members of a handful of listservs). Relatively few of the ≈ 3500 members of these listservs

responded to the survey. One might therefore question whether the responses were typical of the experiences of faculty across the country. We therefore devised a methodology to survey faculty “at random.”

We used two lists: A list of American universities, <http://www.clas.ufl.edu/CLAS/american-universities.html>, and a list of engineering graduate schools, <http://www.allaboutgradschool.com/usgradschools/engineering/engineering.htm>. We used the first list, sorted it randomly (based on Excel's random-number function), and took the first few dozen schools on the list. Then we tried to select 3 engineering departments and 3 other departments from the school. We looked up e-mail addresses of all faculty in these departments, and chose every third one to receive the survey.

However, this didn't yield enough engineering faculty, so we then went back and used the list of engineering graduate schools to try to balance it, following a similar procedure. According to this methodology, we sent the survey out to 656 faculty. Only 69 of these answered the survey, a response rate of 10.5%. Although this was disappointingly low, it was still quite a bit higher than the rate at which listserv members answered, and it was not biased toward faculty who are on listservs (whom one might think would be more likely to use other on-line technology such as CMSs).

Table 4. Penetration of Course-Management Systems, Original vs. Random Sample

| | Original sample (n=197) | | | Random sample (n = 69) | | |
|-----------------------------------|----------------------------|-----|------------|---------------------------|-----|------------|
| | Yes | No | Don't know | Yes | No | Don't know |
| Has your university chosen a CMS? | 87% | 5% | 6% | 77% | 16% | 6% |
| Have you used the system? | 67% | 23% | | 48% | 41% | |

Note: Answers do not add to 100% because some respondents did not answer the question.

Table 4 shows that the random sample used CMSs less heavily, and their universities were less likely to have adopted them. Even this may overstate the usage of CMSs, because, as one respondent explained, after answering “No” to the first couple of questions, he decided that it really didn't apply to him, and answered no further. (The author's e-mail asked respondents to fill out the survey whether or not they used CMSs, but evidently this request was not always followed.) Their answers as to why they didn't use their CMS were very similar to the answers from the original sample, and are not displayed here.

Looking at the features used by the random sample, we can see that they made less use of the features of CMSs, especially automatically updated class rosters and calendars of course assignments. Only their use of e-mail to individual students seemed to be as frequent as the original sample.

Table 5. Usage of CMSs vs. Outside Software, Original vs. Random Sample

| | Original | | | Random | | |
|------------------------------------|-----------------|------------------|-------|-----------------|-----------------|-------|
| | Inside CMS | Outside CMS | Ratio | Inside CMS | Outside CMS | Ratio |
| E-mail to individual students | 90 (46%) | 154 (78%) | 0.58 | 22 (32%) | 52 (75%) | 0.42 |
| E-mail to class mailing list | 100 (51%) | 116 (59%) | 0.86 | 26 (38%) | 35 (51%) | 0.74 |
| Automatically updated class roster | 88 (45%) | 50 (25%) | 1.76 | 12 (17%) | 14 (20%) | 0.86 |
| Calendar of course assignments | 90 (46%) | 65 (33%) | 1.38 | 21 (30%) | 27 (39%) | 0.78 |
| Grade (mark) reporting to class | 96 (49%) | 65 (33%) | 1.48 | 22 (32%) | 18 (26%) | 1.22 |
| Lecture generation | 44 (22%) | 64 (32%) | 0.69 | 12 (17%) | 23 (33%) | 0.52 |
| Bulletin boards | 61 (31%) | 23 (12%) | 2.65 | 14 (20%) | 10 (12%) | 1.40 |
| Discussion groups | 66 (34%) | 18 (9%) | 3.67 | 12 (17%) | 8 (12%) | 1.50 |
| Web-based testing | 53 (27%) | 15 (8%) | 3.53 | 11 (16%) | 4 (6%) | 2.75 |
| Video | 7 (4%) | 14 (7%) | 0.50 | 2 (3%) | 5 (7%) | 0.40 |
| Audio | 11 (6%) | 11 (6%) | 1.00 | 2 (3%) | 2 (3%) | 1.00 |
| Chat rooms | 31 (16%) | 7 (4%) | 4.43 | 6 (9%) | 2 (3%) | 3.00 |

One clear difference between the original and random samples is the higher usage of Blackboard by the random sample, reflecting a national trend. The “other” responses were divided among a large number of systems, many home-grown.

Table 6. Usage of CMSs vs. Outside Software Original vs. Random Sample

| | Original sample | Random sample |
|------------|-----------------|---------------|
| Blackboard | 68 (35%) | 31 (44%) |
| WebCT | 81 (41%) | 12 (17%) |
| Other | 40 (13%) | 15 (21%) |
| No answer | 34 (12%) | 11 (12%) |

6. Results by Discipline

To see if engineering faculty were different from other faculty in their use of CMSs, we divided the respondents into three categories: Engineering, Computer and Information Sciences, and Other. The numbers for CIS are broken out separately because opinions differ on whether they are engineering. However, faculty in departments of Computer Science and Engineering were classified as Engineering for this tabulation.

The results (Table 7) show that there is not a lot of difference between Engineering and Other. Computing instructors seem somewhat more likely to “roll their own” method of reporting grades to the class and less likely to put their lectures in the course management system. Both of these differences are understandable. The engineers’ usage looks more like the non-computer-scientists.

Table 7. Usage of CMSs vs. Outside Software, by Discipline

| | All Disciplines (n=266) | | | Engineering (n=82) | | | Comp. Science (n=81) | | | Other (n=103) | | |
|-------------------------------|-------------------------|------------|-------|--------------------|------------|-------|----------------------|------------|-------|---------------|------------|-------|
| | Inside | Outside | Ratio | Inside | Outside | Ratio | Inside | Outside | Ratio | Inside | Outside | Ratio |
| E-mail to individual students | 42% | 77% | 0.54 | 45% | 77% | 0.59 | 32% | 80% | 0.40 | 48% | 76% | 0.63 |
| E-mail to class mailing list | 47% | 57% | 0.83 | 52% | 59% | 0.90 | 40% | 62% | 0.64 | 50% | 51% | 0.96 |
| Automatically updated roster | 38% | 24% | 1.56 | 45% | 20% | 2.31 | 36% | 28% | 1.26 | 33% | 24% | 1.36 |
| Calendar of assignments | 42% | 35% | 1.21 | 43% | 34% | 1.25 | 41% | 47% | 0.87 | 42% | 25% | 1.65 |
| Grade reporting to class | 44% | 31% | 1.42 | 48% | 27% | 1.77 | 42% | 47% | 0.89 | 44% | 22% | 1.96 |
| Lecture generation | 21% | 33% | 0.64 | 26% | 37% | 0.70 | 17% | 41% | 0.42 | 20% | 23% | 0.88 |
| Bulletin boards | 28% | 12% | 2.27 | 28% | 13% | 2.09 | 30% | 12% | 2.40 | 27% | 12% | 2.33 |
| Discussion groups | 29% | 10% | 3.00 | 18% | 4% | 5.00 | 38% | 9% | 4.43 | 31% | 16% | 2.00 |
| Web-based testing | 24% | 7% | 3.37 | 22% | 1% | 18.00 | 22% | 7% | 3.00 | 27% | 12% | 2.33 |
| Video | 3% | 7% | 0.47 | 6% | 7% | 0.83 | 0% | 2% | 0.00 | 4% | 11% | 0.36 |
| Audio | 5% | 5% | 1.00 | 5% | 2% | 2.00 | 5% | 4% | 1.33 | 5% | 8% | 0.63 |
| Chat rooms | 14% | 3% | 4.11 | 10% | 1% | 8.00 | 14% | 4% | 3.67 | 17% | 5% | 3.60 |

7. Summary

Course-management systems are becoming widespread, but there are still significant barriers to their penetration. It is difficult to learn more than a small set of features at a time, and it is time consuming to place existing Web pages into the systems. It is also difficult to get them out, if an institution changes vendors or an individual moves to an institution with a different vendor. Many faculty regret the loss of control that comes with moving to a CMS. Others say they are too slow. Nonetheless, there is evidence that instructors are beginning to use the more specialized features of CMSs, like Web-based testing and chat rooms. One caveat is that although there were over 250 responses to this survey, the response ratio was still low, and thus the results may not reflect the experience of faculty as a whole. There is a chance that our sample may use CMSs more extensively than the rest of the population.

Bibliography

- [1] E. F. Gehringer, "To see or not to see: Access restrictions on course Web sites," *Proc. American Society for Engineering Education 2002 Annual Conference*, Session 1520.
- [2] Nancy Shute, "Open University," *ASEE Prism* 11:3 (November 2001), pp. 18–25.

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