Conclusion

This study of how faculty members use course management systems in the University of Wisconsin System (UWS) provides numerous insights into technology adoption and use. These derive from the three methodologies employed: the quantitative survey of 730 faculty and instructional staff CMS users, the qualitative interviews with 140 faculty members and instructional staff, and examination of usage logs within UWS course management systems.

Measurement Tools

Today’s course management system (CMS) products are weak in the area of measurement tools. In the process of trying to measure actual CMS use for this study, we found the tools and reports available directly from the CMS insufficient. Measuring CMS usage is vital: without measurement, organizations have little sense of how much these technologies are being used and how this use is changing over time. A more accurate understanding of use levels and patterns will contribute to more effective planning and training.

Measurement is frequently difficult because:

- most course management systems have poor built-in reporting tools,
- it isn’t always clear what counts as an active course,
- a communication gap often exists between those who run CMS servers and databases and other academic administrators, and
- some CMS administrators fear that the counts would be low and that this would result in withdrawal of political and financial support for the CMS.

CMS vendors must develop better tools for measuring the technology’s use at both the course and individual-tool levels. In addition, institutions must develop policies to maximize the data collected in course setup and maintenance within their CMS so that they have as much data as possible in an easily accessible format.

CMS Use in Face-to-Face Courses

A significant finding of the study is that 80 percent of CMS use occurs in the course of face-to-face instruction, either to enhance regularly scheduled classes or to create hybrid courses in which online activities and exercises replace part of the meeting time. In the survey sample, less than 27 percent of faculty and instructional staff CMS use was for fully online courses.

These facts come as no surprise to those involved in supporting CMS use on campus. But given the traditional association of
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course management systems with distance education, especially among higher-level administrators, this fact should compel a substantial rethinking about how to support and implement course management systems. Given the base of use in mainstream instruction, the growth rate of CMS adoption will likely be higher than anticipated.

**Rates of CMS Use**

The extent to which faculty use the full range of CMS tools is less than many may have anticipated, but use is growing quickly. Faculty tend to first adopt the static content tools that let them post announcements, syllabi, and text or graphic content. Once they’re more familiar with the system, they begin using the assessment, gradebook, and communication tools. A strong majority of faculty report that their CMS use has increased over time. Study findings suggest that most faculty who now use course management systems primarily for delivery of static content will begin to use more CMS tools and capabilities. This will occur in response to

- administrative leadership;
- learning from peers;
- training by campus learning technology centers;
- greater faculty awareness of and comfort with the technology, and their identification of the CMS as a solution to a particular pedagogical challenge;
- student requests;
- desire for cost savings or a way to organize online course delivery; and
- improvements in CMS ease of use and in power and reliability of particular CMS tools.

Faculty members respond much better to efforts to facilitate their CMS use than they do to directives that the technology must be used. They need to be persuaded to use course management systems and to build them into their teaching. If faculty members are not persuaded, CMS use tends to be short-lived and ineffective.

Numerous factors clearly serve to slow faculty adoption rates, whether of the CMS as a whole or of specific tools within the CMS. Factors that faculty consistently identified as inhibiting their CMS adoption include

- lack of time to learn and to use a CMS,
- problems with student CMS use,
- inflexibility of the software, and
- inability of the CMS to map to teaching or organizational goals.

**Administrative Leadership**

Another finding of this study is that administrative leadership plays a strong role in shaping and encouraging faculty CMS use. Where strong and positive administrative leadership is exercised, it has resulted in extensive and effective faculty CMS use. Where there is little or poor leadership, adoption rates are lower, CMS use is less effective, and use often engenders student resistance and resentment.

Given that this study is about how faculty use course management systems, it is beyond the scope of the report to examine the nature of institutional best practices in promoting CMS use. From the data, however, researchers observed that the practice of relying on faculty to adopt technology at their own speed is not sufficient. Strong leadership from above is required if faculty are to adopt the technology at sufficient rates to justify the institutional expenditure necessary to support a CMS. They also noted that faculty respond better to the facilitation of their CMS use or to the active involvement of senior leadership than they do to decrees or directives from above.

Administrative leadership at various levels is required to encourage faculty to use course management systems and to help
shape that use. Where leadership is exercised, it is most effective when it is facilitative, supportive, engaged, and encouraging.

**Faculty Training**

Training in CMS use is essential to encourage higher levels of faculty use and more effective uses of the technology. Twenty-nine percent of the faculty and instructional staff surveyed cited training as an important factor in their initial adoption or expanded use of a CMS. Some training models work better than others. We found that training is most effective when it
◆ occurs as close to the faculty as possible, in the same college or at their campus Learning Technology Center;
◆ is carried out on as small a scale as practicable (faculty expressed a strong unwillingness to attend large group training sessions);
◆ utilizes peer training and mentoring; and
◆ shows faculty real examples of CMS uses.

Interestingly, many faculty members want training focused on the technology rather than pedagogical strategies. Effective trainers understand this and advertise training in the technology while at the same time addressing pedagogical issues or creating an environment in which faculty can explore these issues in the company of their peers.

**The Importance of Management**

One of this study’s findings is that faculty place a high value on CMS management functions. Faculty consistently appreciate how course management systems facilitate communication, grade keeping, assessment and evaluation, and class management. Most faculty use a CMS as an administrative tool. This does not mean they value the software less. On the contrary, this may make the technology more appealing in that it holds the promise of helping them save time and be more efficient in the administrative tasks that pull them away from things they value: the creative and pedagogical aspects of teaching.

One implication of this tendency is that the emphasis on course management systems as pedagogical tools might be a bit misplaced. As this study describes, course management systems can certainly have a positive impact on pedagogy and learning, but this largely stems from how faculty members choose to use the tools. Using a CMS to facilitate quiz administration and other organizational tasks frees faculty to focus on more creative activities. Acknowledging that course management systems can be used effectively in many different ways will likely speed faculty adoption.

**CMS Effects on Pedagogy**

Using a CMS invites faculty to rethink their course instruction and instructional environment, resulting in a sort of “accidental pedagogy.” Although this study was not designed to empirically measure the effect on student learning, it was able to measure faculty perceptions about factors that traditionally improve the learning environment: transparency, accountability, communication, interactivity, and student engagement with the course materials.

Faculty members use the CMS to increase both the transparency of their course and student accountability. When faculty use the online gradebook, they make their assessment of student work more visible. Students can track their progress through the course. They have a greater sense of how they are doing and learn to recognize their strengths and weaknesses. Faculty report that this seems to give students a greater ownership of their success or failure in the class. The class and their progress in it are less opaque, and they can see, understand, and affect the
outcome by making a greater effort. Faculty also report that posting student work in the CMS or in a discussion forum helps improve student performance. Knowing that other students can see their work increases their incentive to perform, and improved performance hopefully leads to better learning gains.

Fifty-nine percent of faculty believe that their CMS use contributes to greater contact between them and their students. This comes at the cost of faculty’s spending greater time on CMS use. But the gains from this increased contact cannot be underestimated, particularly in larger classes. Similarly, course management systems play an important role in increasing the time students spend on tasks. Learning continues out of the classroom, and students can engage with the materials at their own pace and in a slower, more deliberate fashion. Many faculty members describe this as an important pedagogical benefit of course management systems.

Finally, using a CMS lets many faculty include more interactive materials and exercises in their courses. A lot of this interactivity consists of group work and increased contact between faculty and students and among students themselves. The rates at which faculty use interactive simulations are quite low, reflecting low levels of awareness on their part about where to find digital learning materials and how to use them in their classes. This suggests the need for more training to help faculty identify and use digital learning materials.

**Students’ Technological Literacy**

Contrary to the popular myth of students as the Internet Generation wünderkinder who drive faculty use of technology and course management systems, this study shows that students not only don’t encourage CMS adoption but in fact discourage it. In the survey of UWS faculty, only 3 percent felt pushed by students to use the CMS. Conversely, 16 percent of faculty felt that student difficulties with or dislike of the technology caused them to use a CMS less often or less extensively.

Faculty most often cite students’ lack of technology skills as a contributing factor to their decreased use of a CMS. They consistently report that their students seem to have inadequate technology proficiency and that this inhibits their CMS use. Complaints about students’ technological literacy focus on their lack of technical-problem-solving skills and basic technology-literacy skills such as file management.

It was beyond the scope of this study to gauge the extent of the problem with student technology skills. It could be merely a matter of student preferences, or faculty could be projecting their own fears of and inadequacies with instructional technology onto their students. Whatever the root cause, administrators should take steps to address the issue on their own campuses, probably by providing more training for students in technology use in general and CMS use in particular. This should include training and education in the practical, social, and ethical aspects of technology use.

Widespread problems with student access to technology certainly contribute to faculty perceptions that students have weak technology skills. Although the UWS annual survey of student technology access shows that students have very high levels of access to computers at home, in university computer labs, and in dormitories, faculty consistently report that they cannot rely on good student access to a CMS and so are reluctant to build CMS use into a course. Internet access seems to be a particular problem. Many faculty report that students do not have access with enough bandwidth to use
the CMS effectively and that access itself isn’t always reliable.

**Faculty Control**

The study also reveals that faculty resistance to CMS use stems in part from their perception that these tools diminish their control over their teaching and environment. There are two aspects to faculty concerns about how course management systems affect their control and autonomy. The first relates to their control over teaching, and the second relates to a reliance on technology in general.

Some faculty resist CMS use because they believe it will interfere with the teaching process. They argue that the CMS’s heavily structured nature excessively constrains teaching, getting in the way of how they want to teach and thus inhibiting student learning. Another faculty concern about control arises from the perception that CMS use places a layer of bureaucracy between faculty and their course materials. Many faculty members find this problematic and say it stifles the flow of good teaching. The bureaucracy involves the support structures that faculty have to work with to get their courses up and running in a CMS. These problems seem to be much more pronounced in fully online distance-education courses, especially those for which someone other than the faculty member does much of the course development and where the expectation is that course materials will be used more than once. Having to work with others in constructing and updating a course raises enormous control issues, and battles ensue between faculty and support staff over who determines content and the look and feel of the class.

Administrators must therefore address the issue of faculty control and faculty perceptions that course management systems erode that control. This is especially true if the administration wants to increase CMS effectiveness and use. Many faculty concerns about course management systems and control stem from the fact that, like any other enterprise initiative (such as enterprise resource planning), course management systems require some standardization. In this case it is not about standardizing accounting transactions (and even this is a challenge in research universities) but about standardizing one of the most durable and idiosyncratic activities of the institution. Classroom and research autonomy are two of the most alluring features of the “life of the mind” embodied in the faculty experience. Many perceive the standardizing tendencies inherent in course management systems as wrong and demoralizing. Overcoming these psychological, cultural, and philosophical barriers is a challenge.

**Security: Copyright Protection and Privacy**

Course management systems are sometimes touted as providing an important part of the solution to the thorny problem of providing content to students without infringing on copyrights. According to this study’s findings, this does not seem to be a major concern for faculty and is not a significant factor compelling or shaping their CMS use. To the extent that faculty members are concerned about copyright and link that concern to the CMS, many see the CMS as a way to protect their own intellectual property. While some faculty worry about how to teach online and remain within the bounds of copyright law, most seem largely unaware of or unconcerned by the issue. Awareness is much higher among administrators and those who work with faculty in campus Learning Technology Centers.

Faculty concerns about student privacy, however, are much more pronounced. They clearly understand the need to protect stu-
dent privacy, in particular the confidentiality of student grades, and the potential promise of course management systems to address this. The convenience and security of being able to post student grades online using the CMS gradebook is a strong factor compelling faculty to start and continue using a CMS.

**Change Management**

Change management is a growing concern among those who administer course management systems and will likely continue to be a major issue, at least in the medium to long term. Universities face two potential sources of CMS change: changing from one version of a product to another, which can often involve substantial reconfiguration and disruption; and changing from one product to another as CMS products disappear or are replaced by superior technology, or as universities standardize on a particular CMS.

We must not understate the impact of CMS upgrades on faculty. Don Sorenson, a faculty member at the UW–Whitewater School of Business, argued that “what’s killing people are updates of everything.” This frustration intensifies when faculty feel that CMS vendors are addressing bells and whistles in the upgrades rather than improving core features, especially ease of use for the gradebook and the assessment tools.

Faculty particularly fear changing from one CMS product to another. The volatility of the CMS marketplace has forced many UWS faculty members to make such a change. This has frequently been difficult and has caused faculty to spend considerable amounts of extra time learning the new system and reconfiguring their courses. When discussing the possibility of yet another change, many faculty threatened to stop using a CMS altogether.

Given the personal costs to faculty, their aversion to change is understandable. But numerous factors exacerbate the situation. First, faculty demonstrated a lack of understanding about the nature of the learning technology market, especially concerning change and innovation. Second, faculty have become perhaps too aware of branding in the CMS market and may even have become irrationally attached to one or another CMS. Terry Brown of the UW–River Falls English department described the interaction on her campus between users of two major CMS products as a form of the “culture wars.” Third, CMS administrators have been relatively slow to develop comprehensive policies and procedures for moving courses from one product or version to another.

Many of these faculty concerns about change will diminish, if not disappear, as the metadata standards movement gains momentum and as it becomes easier for faculty to move content into, out of, and between products. But it would be a grave error to pin all hopes on portability. Also needed are policies and procedures for making changes in course management systems, and reasonable faculty education about the CMS marketplace. University administration must plan for CMS changes in the same way they handle other systems, with version and product updates in mind. They should put considerable effort into developing effective strategies to minimize disruption, and these strategies will likely include content management.

Change management is of increasing concern to administrators and will continue to be until CMS products have matured and technical standards have gained widespread use. Given the inevitability of change, institutions need to work at managing change and assuaging faculty fears about it.