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Measuring Student Experiences with Course Management Systems

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Overview

One of the continuing challenges for higher education institutions is improving the quality and efficiency of instruction in the midst of tight and often declining budgets. In addition to a press for additional accountability related to learning, today's students may expect that more technology will be available to them in their courses. Oblinger and Oblinger (2005) describe Net Generation students as digitally literate; preferring to learn by doing; experiential; and more comfortable with image-rich environments than text. In the interest of improving technology use in courses, many institutions have acquired and implemented a course management system (CMS) to improve the online learning environment for students and educators.¹

Sometimes viewed as a panacea and sometimes as a bane for instructors, and often considered an expensive environment to acquire and maintain, a CMS has been implemented at most, if not quite all, higher education institutions. The impact of these technology investments on teaching and learning is not widely assessed or known. Now that course management systems are past the incubation stage at many institutions, it is possible to measure their impact on the student experience. While there has been minimal gathering of statistics about use and satisfaction with course management systems to date, those institutions that have undertaken this exercise have found the results valuable to their efforts to improve their CMS deployments.

There are several commonly used methods to assess the impact that course management systems have on teaching and learning. The most common method is to log and analyze CMS use data through reports and usage patterns. While this method does not measure learning per se, it does allow institutions to assess the patterns of system usage—the hours of the day, the days of the week, and the times of the year when the system is most frequently used by students and faculty. Through this measure, institutions can schedule system upgrades and downtimes for when they will have the lowest user impact. Another method is to ask faculty what features they use, what their experiences are with using the CMS, and how they think it impacts teaching and learning. Sometimes institutions ask students about their CMS experiences, including which CMS features they like and why and how they think the CMS has impacted their course experiences. Although such reports cannot measure learning, they do allow researchers to assess trends such as student engagement, the relationship of CMS use and grade performance, and other things that may provide credible proxies for actual learning or at least “interesting indicators” of learning.

This research bulletin draws on the results of several research studies that are centered on the student experience with course management systems. These studies provide insight on student CMS use and experiences and lay a valuable foundation for the future measurement of their experiences with these systems.

Highlights of Student CMS Experiences

The most fundamental measure of student experience with course management systems is the degree to which students use the systems.

Student CMS Usage

One method to assess student usage of course management systems is to examine the system logs. There are tools available that can transfer log data into graphic representations of the number of students who use each feature of the CMS. One such tool is CourseVis (available through open source). Using this tool, an instructor can isolate usage of the individual features of the system. The instructor might examine the discussion feature of the CMS, for example, and learn which students initiate discussion (Mazza & Dimitrova, 2004). The instructor can determine how active students are and assist those who need to increase their participation.

One study that examined undergraduate student perceptions about their experiences with CMS features (Kvavik & Caruso, 2005), included 18,039 freshmen and senior respondents. Using a Web-based quantitative survey, students noted their use of course management features and how valuable they found them. More than 72 percent of the students reported having used a course management system. Figure 1 illustrates that students noted that they used the syllabus more than any other feature of the CMS (95.2 percent), followed by online reading (94.0 percent).

Figure 1. CMS Features Used by Students

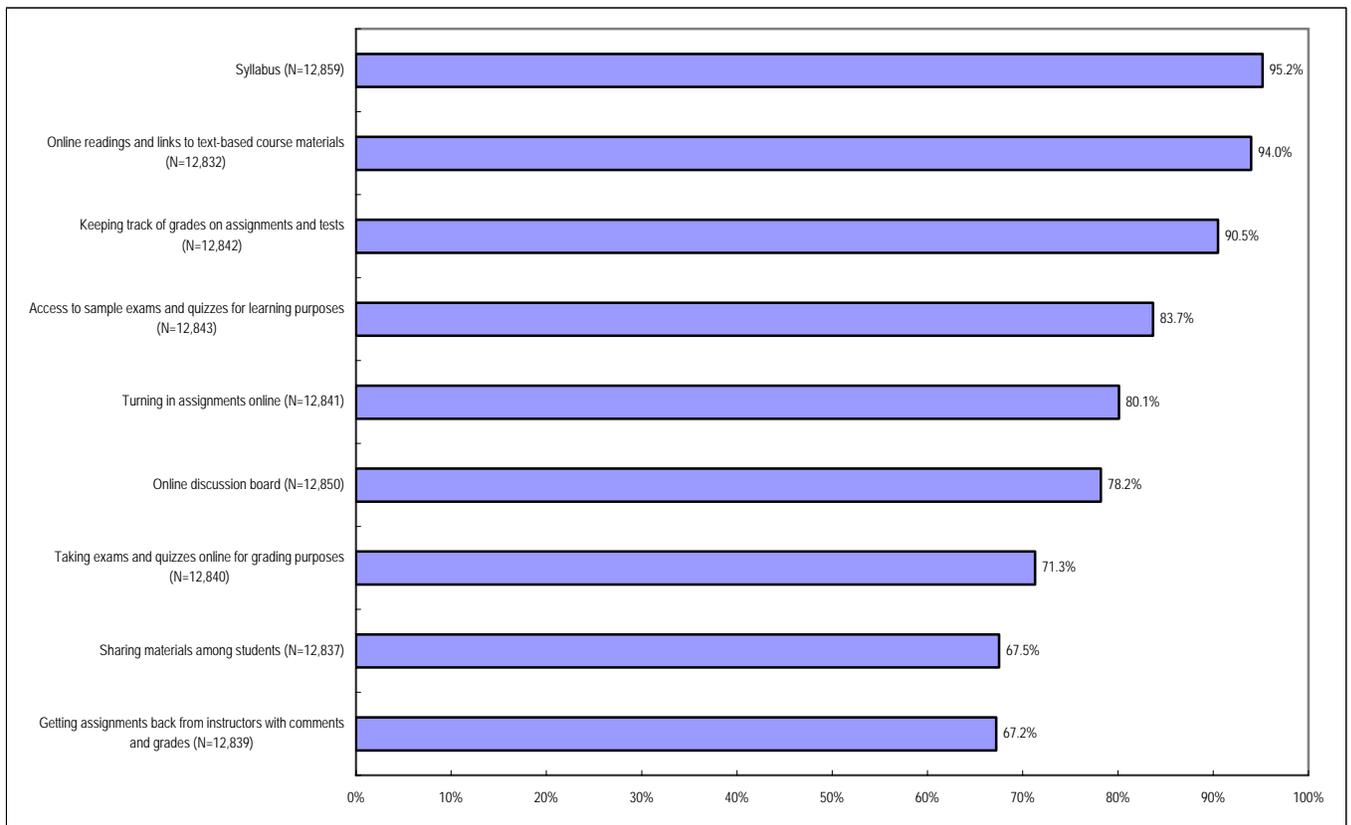
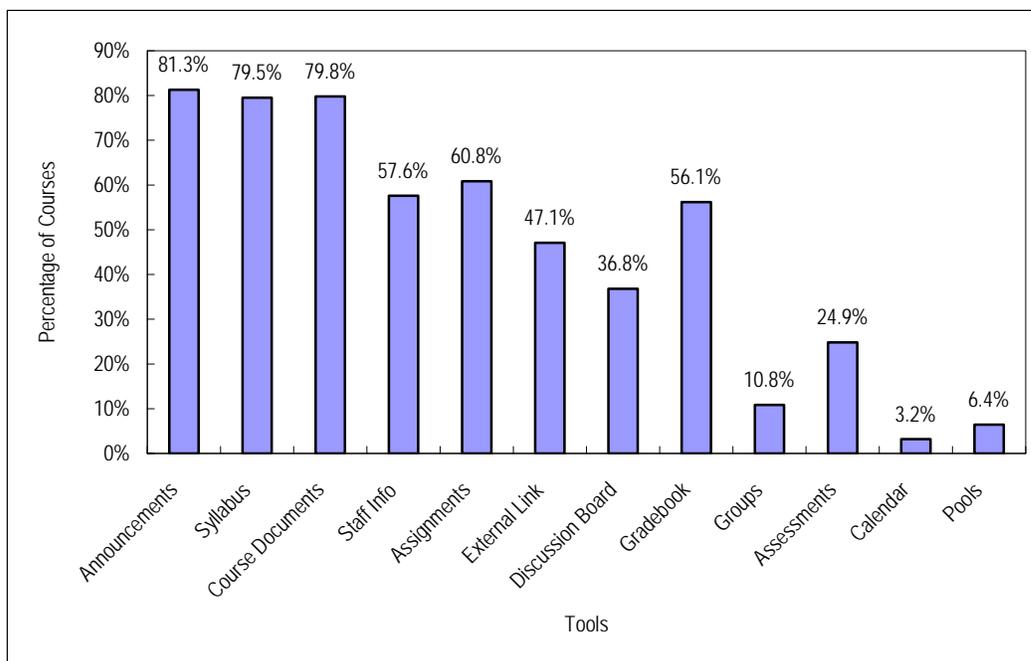


Figure 2 illustrates that student findings agree with faculty CMS use as identified in ECAR's 2003 study, *Faculty Use of Course Management Systems* (Morgan, 2003).

Figure 2. CMS Tool Use, UW–Milwaukee, Spring 2002 (N = 342)



CMS Availability for Students

Students want the CMS to be reliable and available whenever they need it. In a study by the Alliance for Higher Education Competitiveness, 26 percent of the institutional respondents ranked a highly available 24 x 7 CMS as a top priority from a list of 24 items important to student support services for the next three years. Another 58 percent already were satisfied with their CMS availability (Abel, 2005).

The students' needs for CMS availability were reflected in the ECAR study (Kvavik & Caruso, 2005) in student responses to the open-ended questions. In those responses, the convenience that course management systems provide was the common theme. Students often commented about their busy lives, and they appreciated the flexibility to study with course materials and services available to them when their schedules permitted. Students also noted that having course materials online allowed them to take courses that they might otherwise not have been able to take. One student commented, "Online courses have allowed me to take more hours in a semester because I can work at night. I can only be on campus at certain times because of other commitments."

The importance of the CMS reliability and availability is also reflected in a study at the University of Alabama. According to Rivera and Rice (2002), this study sought to compare and evaluate student performance, student satisfaction, and instructor experiences between course sections taught in three different ways: traditional, hybrid, and Web-based. Results showed that the effectiveness of the instruction was hampered, however, by technical problems, a steep learning curve for using the CMS, inadequate

technical support, insufficient technical skills among students, and other technical issues. While these problems did not reduce student test scores in the online sections, students did report a lower satisfaction in response to the question of whether the difficult course material was explained clearly.

CMS Benefits

Another method for examining CMS effectiveness is to ask students about the system's benefits and its features. When students in the ECAR study were asked about the benefits of the various features of a course management system, they responded that all but one of the features were valuable or very valuable (Kvavik & Caruso, 2005). The most valued feature was keeping track of grades on assignments and tests, followed by access to sample exams and quizzes. Online discussion boards were valued least, with a mean of 1.86 where 1 = not valuable, 2 = valuable, and 3 = very valuable (see Table 1).

Table 1. Perceived Value of CMS Features

Feature	N	Mean	Std. Deviation
Keeping track of grades on assignments and tests	11,627	2.57	0.565
Access to sample exams and quizzes for learning purposes	10,748	2.50	0.578
Syllabus	12,236	2.36	0.582
Turning in assignments online	10,291	2.27	0.666
Getting assignments back from instructors with comments and grades	8,624	2.27	0.674
Online readings and links to text-based course materials	12,065	2.25	0.615
Taking exams and quizzes online for grading purposes	9,149	2.18	0.709
Sharing materials among students	8,664	2.09	0.648
Online discussion board	10,052	1.86	0.716

Scale: 1 = not valuable, 2 = valuable, and 3 = very valuable

Other studies also report benefits using CMS functions. In a 2005 study at the University of Michigan, students reported that out of 13 functions, syllabus, online readings, sample quizzes/exams, and turning in/getting assignments online were the most helpful; least helpful were logistics, chat, and online office hours (Berger, 2005).

Access to Grades

In a study at the University of Southern Indiana in 2004, more than a thousand undergraduate students reported that access to grades was the most useful material on the CMS (Bonnell, 2004). This agrees with the responses to the 2005 ECAR study. Having online access to their grades provides students with a convenient way to know how they are doing in the course.

Access to Sample Exams and Quizzes

Access to sample exams and quizzes was rated highly by students in the ECAR study. Ben McNeely's description of the Net Generation student in his article in *Educating the Net Generation* supports this finding. "They get bored if not challenged properly, but when challenged, they excel in creative and innovative ways. They learn by doing, not by reading the instruction manual or listening to lectures" (McNeely, 2005). Sample exams and quizzes not only allow students to learn by doing but also provide a mechanism to improve their performance on graded tests and quizzes. In Project cms@wbw, of the students who reported that courses using Web-enabled technology improved learning, 88 percent noted that access to sample exams supported this learning (Hanson, 2003).

Online Assessments

Taking quizzes and exams for grading purposes brings a mixed review by students. Overall, in the ECAR study, students found taking quizzes and exams for grading purposes beneficial, but they also noted that how the quiz or exam was set up and administered mattered. The online quiz/exam did not work well when the subject matter didn't lend itself well to online assessments. Examples cited include those subjects requiring essay response or "the showing of work" (Kvavik & Caruso, 2005). In a 2003 study at the University of South Carolina, nearly one-third (31 percent) of students in a Spanish course found the online quizzes difficult or very difficult to use. The study researcher concluded that this was because students couldn't successfully navigate between the audio/video component and the comprehension quizzes (Fritz, 2003). Both of these studies reinforced the importance of using the online assessment tool when it fits the subject matter well.

Online Discussion

Since Net Generation students are characterized as interactive and enjoy socializing, the online discussion board offers great potential to engage students in course subject matter. Yet, in the ECAR study, students rated the online discussions as the least valued among the course management system features. This finding was supported in student interviews. Students had mixed feelings about the value of the online discussions. They complained when the online discussions were perceived as busy work and engaging conversations did not take place. They were pleased when a robust discussion happened online and carried into the classroom. The students agreed, however, that well-administered online discussions were very useful (Kvavik & Caruso, 2005).

Other studies have also asked students about their experiences with online discussions. In a study of electronic discussions for three sections of an American government course, students responded to an end-of-semester survey and evaluated the electronic discussion in achieving course objectives. Students perceived that "improving your grade in this course" was of the highest value, followed by "learning something new." Overall, students reported a positive experience with electronic discussions. Also, since each of the three sections had different instructors with different approaches to use of the discussion board, the students perceived the value of the electronic discussion

slightly differently in each of the sections (Williams & Murphy, 2002). Again, this underlines the importance of well-designed and well-understood use of the online discussion feature.

CMS and Learning

In some studies, students reported their perceptions that the use of a CMS improves learning. Bonnell (2004) reports that in the University of Southern Indiana study, students were asked to what degree the availability of course materials in the CMS supported their learning. Overall, students perceived that the system supported their learning with a mean of 2.17 where 1 = very much, 3 = somewhat, and 5 = not at all. In addition, 52 percent of the students perceived that they felt their academic performance could be improved more than somewhat by using the CMS. In a study at the University of Georgia, students responded to the statement, "The [CMS] site, as a whole, was useful to my learning," with a mean of 4.03 where 1 = strongly disagree, 2 = disagree, 3 = agree/disagree, 4 = agree, and 5 = strongly agree (Angulo & Bruce, 1999).

In the ECAR study, students were asked if IT in their courses improved their learning. More than 74 percent of students agreed or strongly agreed. When correlated with experience with a CMS, 84.9 percent of students who reported a very positive experience with a CMS agreed or strongly agreed that IT in courses improves learning (Kvavik & Caruso, 2005).

Hanson (2003) reported that in Project cms@wbw, students reflected their perceptions that there were learning benefits using the CMS. The top seven learning benefits, by percentage of student respondents, were:

- Access to sample exams and quizzes for learning purposes (88.2 percent)
- Access to audio/video materials (78 percent)
- Sharing materials among students (71 percent)
- Online readings and links to other text-based course materials (61.8 percent)
- Online discussion board (posting comments, questions and responses (49.6 percent)
- Taking exams and quizzes online for grading purposes (46.3 percent)
- Getting assignments back from professor with comments and grade (46.2 percent)

A study at the University of Alabama measured the extent to which IT improved learning by comparing average exam scores of three different sections of the same business course. The first section was a traditional lecture/discussion format; the second a Web-based section; and the third a hybrid section using a CMS, employing a mix of traditional and Web-based delivery methods. The results indicated little difference in exam scores among the sections (Rivera & Rice, 2002).

As we examine formal studies, we observe that most show “no difference” in formal assessments (for example, tests of what was actually learned). This no-difference finding is in itself a victory for e-learning. Even though much of the self-reported data points to a conclusion that as of now, the CMS is largely perceived as valuable because it reduces the “administrivia” associated with collegiate learning and enhances feedback (better access to faculty, grades, exam scores, and so forth), these factors seem to increase satisfaction and can potentially enhance learning. The fact that the interactive elements of a CMS are getting such little use and mixed results suggest that the real potential of the CMS as a learning platform must await a maturation in the pedagogies with which they are bundled.

The results of all these studies seem to indicate that students generally perceive some benefits when a CMS is used in instruction. Further study is needed to assess CMS impact. As CMS function use is expanded and new functions are implemented, it would be useful to study their impact on student performance.

What It Means to Higher Education

Successful Internet-supported learning environments include student-support services with mechanisms to obtain student feedback.

Measurement/Assessment of CMS

In the Alliance for Higher Education Competitiveness study of 2005, at least one-third of the 12 reporting institutions used student focus groups or surveys to determine which e-learning program features are most important to students (Abel, 2005).

At Indiana University, faculty, staff, students, and others are encouraged to submit suggestions for improvements to their CMS, the Oncourse Collaboration and Learning environment (Indiana University, 2005). These suggestions are reviewed and prioritized by campus-level committees and implemented on an ongoing basis.

Assessing CMS service support is a part of larger overall assessment of the online teaching and learning environment. Parker (2004) suggested assessing the online teaching and learning environment with these questions:

- What is the purpose for offering this course?
- Do we know what we expect students to learn?
- Do we have the technological infrastructure to support our students? Is it up-to-date?
- How skilled are our course developers and instructors in the online environment?
- What technical assistance do we have available?

These questions and others need to be explored with students and faculty so that institutions can obtain maximum benefit from their CMS investments.

New and Expanded CMS/Learning Environment

Course management systems as we know them are emerging with new features and expanded functionality. Institutions should explore how to use new features as they become available, as well as increasing the use of existing ones. For example, Lippincott (2005) recommended that libraries and information service providers design their resources to fit Net Generation students' researching needs. This includes integrating subject guides or pathfinders into course management systems or other locations conducive to use.

Comments from students in the ECAR student study (Kvavik & Caruso, 2005) reflect the need for expanded use of existing features of the course management systems: "The course management system, when used to its fullest potential, gets the student more involved in the course work than is possible with only a text book and lecture." Today, some of the interactive features of course management systems are little used, and perceptions of their usefulness are mixed. These features, which offer real potential to increase student engagement in course subject matter, should be explored and integrated in the curriculum.

Key Questions to Ask

- How can our institution measure student use and satisfaction with course management systems?
- What can the usage data of the CMS features tell us?
- How can our institution increase CMS reliability and availability?
- What are the most important considerations in faculty training in the use of course management systems?
- What can institutions learn from each other in seeking to improve student satisfaction with course management systems?
- What future feature developments in course management systems will contribute most to learning?

Where to Learn More

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Endnote

1. Course management systems tend to include tools for course organization and communication such as syllabus, calendar, and access to faculty and student address information; tools for access to online course materials; grade books; assessment tools for creating online quizzes and tests; and online discussion boards. Vendors include, but are not limited to, ANGEL, Blackboard, Desire2Learn, First Class, OnCourse, Sakai, Moodle, and WebCT.

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