

Distance Education Courses: How Course Management Systems are Used and Factors Affecting Use

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Course management systems (CMSs)—such as Blackboard, Desire2Learn, or WebCT—contain many integrated features for learning. These features include the ability to transmit files containing course content, evaluate students, evaluate courses, exchange files with students, and interact with students synchronously or asynchronously. The diverse yet integrated set of features in these systems make them well suited to offer courses online for distance learning.

A continuum exists in how faculty members create content in a CMS. One end is a situation where a faculty member creates a course entirely by him or herself. The other end is a situation where a faculty member plays a minor role in course development and most of a course is created by an instructional designer or technologist. In the middle part of this continuum, a course is developed equally by a faculty member and instructional designer or technologist. The help an instructional designer or technologist provides typically starts with technical issues but can easily move into creating a CMS Web site or online course in a way that follows research findings about how people learn (Dick, Carey, & Carey, 2005; Gagné, Briggs, & Wager, 1992).

One area of research in Course Management Systems is analyzing how faculty members use these systems when their primary source of support involves workshops and occasional assistance from an instructional designer or technologist. This would show how faculty members use a CMS with a moderate to low level of assistance when using a CMS for distance learning. Currently, however, research has not focused exclusively on distance learning courses. Instead, research has typically combined distance learning courses with resident and hybrid courses using a CMS (Ansorge & Bendus, 2003; Dutton, Cheong, & Park, 2004; Malikowski, Thompson, & Theis, 2006a; Morgan, 2003; Woods, Baker, & Hopper, 2004). This is not too surprising because CMSs are used about three times more often for resident or hybrid courses than they are for distance learning courses (Arabasz, Pirani, & Fawcett, 2003; Morgan, 2003). However, a need still exists to study how faculty members use a CMS in distance learning courses.

Instructional designers and technologists could use this information when they assist faculty members with creating distance learning courses in a CMS. In some important ways, knowing which features faculty members instinctively use are like a needs analysis (Dick & Carey, 1977; Kaufman & English, 1979). This information tells instructional designers and technologists where faculty members are currently at in their CMS use. In some cases, faculty members may not need to learn additional features to create an online course. In other cases, they will need to learn more features. In both cases, information about how a faculty member uses a CMS can allow instructional designers and technologist to make more informed decisions about how to work with faculty members.

The study described in the remainder of this report exclusively analyzed distance learning courses. A distance learning course was defined as a course that included one resident meeting or less. The study analyzed which features were used most and which factors led to what kind of use. Factors included the college in which a course was offered, the number of students in a course, and the level of a course—such as 100 or 200 level courses.

Method

Thirty-seven distance learning courses using Desire2Learn (D2L) were randomly selected, from a comprehensive university. A research team analyzed each D2L Web site by completing a standard form created for this study, containing 40 items. Completing this form involved counting how often features were used, for a particular course. To increase accuracy, each D2L Web site was analyzed twice. When differences between two analyses were found, the course was analyzed again.

Results

Two categories of results are reported here. The first category shows which features were adopted most. Adoption was defined as using a feature at least once, so using just one quiz question would be categorized as adopting the quiz tool in D2L, although this low level of use was rare. The second category explored which factors were associated with the adoption of CMS features.

Features Adopted Most

Table 1 shows which features were used most and least. In the table, the features called "Content Files" refers to documents added to the "Content" area of D2L. In the Blackboard course management system, this area is called "Course Documents" by default. Examples of these documents include a syllabus, grading rubrics, or a professor's notes for a particular week. The column entitled "Percentage of Adoption" shows the percentage of distance learning courses that used a particular CMS feature.

Table 1. Percent and Standard Deviations of Features Adopted

Feature	Percent of Adoption	Standard Deviation
Content Files	89	31.5
Grade Book	65	48.4
Asynchronous Discussions	46	50.5
Drop Box	46	50.5
Quiz Questions	46	50.5
Synchronous Discussions	5	22.9
Survey Questions	5	22.9
Checklist	3	16.4
FAQ	3	16.4
Glossary	3	16.4
Self-Assess	3	16.4

A notable pattern in Table 1 is that the standard deviation is larger than the percentage of adoption in every case except the two most common features, which were content files and the grade book. Standard deviations this high shows a high level of diversity in the adoption of CMS features.

Factors Associated with the Adoption of Features

As shown in Table 1, a notable difference in the adoption of features occurred between the quiz and synchronous discussion feature, where the percentage of adoption moves from five to forty six percent. The five features that were adopted as much or more than the quiz feature were considered to be "commonly adopted features" and were further analyzed. This analysis explored if commonly adopted features were related to specific factors. The factors considered in this study were the college in which a course was offered, the number of students in a course, and the level of a course—such as 100 or 200. All three factors were analyzed for relationships with each of the five commonly adopted features, for a total of 15 ANOVAs.

Based on these ANOVAs, only one factor showed a significant relationship to only one of the five features. The factor was the college in which a course was offered, and the feature was the quizzing tool in D2L ($p=.002$). To identify which college and which feature, the Scheffe post hoc test was used, because group sizes were similar and variances were not significantly different. This test showed that the College of Education used the quizzing feature significantly less than the College of Social Science ($p=.017$) and the College of Business ($p=.022$). Other colleges in the analysis were the College of Fine Arts and Humanities and the College of Engineering.

Discussion

One of the notable findings in this study is that the factors of class size and level had no significant relationship to the five commonly adopted features. CMSs contain a few features that could be used to meet the needs of large classes (Bongey, Cizadlo, & Kalnbach, 2005) or different class levels. For example, student interaction can be difficult in large classes, which is ironic considering there are so many students available for interaction. In any case, the asynchronous discussion feature in a CMS could be used to facilitate discussions in large classes. Similarly, CMS quizzes could be used as one form of evaluation. These quizzes may save time in large classes because CMS quizzes are automatically graded and results can be automatically stored in a CMS grade book.

CMSs could also be used to meet the learning needs of classes at different levels. Arguably, 100 level classes contain more declarative knowledge and less conceptual knowledge than 400 level classes. Therefore, quizzes may be more helpful in 100 level classes, since quizzes can offer learning activities similar to drill and practice. Similarly, 400 level classes could address conceptual information by using CMS tools for writing or discussion—such as a drop box or asynchronous discussion tools. Any of these items could be used for formative evaluation, summative evaluation, extra credit, or low credit learning activities. For example, CMS quizzes can contain detailed feedback for correct and incorrect answers. This type of quiz could be used

for a low credit learning activity to give students a lesson with feedback that reflects their correct and incorrect understanding of course material.

Instructional designers, technologists, and others who assist faculty members with a CMS could apply these and other findings from this study to make more informed decisions when helping faculty members. One application of these findings is to emphasize CMS features that are well suited for large classes or different levels of classes, as just described. Another application of these findings is to consider the college in which a faculty member teaches when deciding which features to emphasize. For example, faculty members in a college of education will likely be less receptive to using the quiz feature in a CMS, but faculty members in a college of business or social science will likely be receptive to using the quiz feature.

When they assist faculty members, instructional designers and technologists could also consider what this study found to be the most and least used CMS features. This information could be useful when working with faculty members who have a lot or a little experience with a CMS. Faculty members with a lot of experience probably understand the commonly used features, so he or she may need help with the less used features. In contrast, faculty members with little CMS experience will likely need help with the CMS features used most. The most used feature allowed faculty members to share content files, and the second most used feature was the grade book. The least used features were synchronous discussions, survey questions, checklist, FAQ, glossary, and self-assessments. A final issue for instructional designers and technologists to consider is that use of most features is very diverse, with standard deviations usually being larger than the percentage of faculty members who adopt a feature.

Conclusion

This study analyzed how a CMS is used in distance learning courses. When instructional designers or technologists provide assistance with a CMS, an important goal is to select CMS features that are most appropriate for a particular learning objective and activity (Dick et al., 2005; Gagné et al., 1992). Currently, it appears as if some CMS features are being used for many learning objectives and activities, and other CMS features are rarely used at all. Hopefully, the information in this study can help instructional designers and technologists assist faculty members in selecting the most appropriate CMS feature for specific learning objectives and activities in distance learning courses (Malikowski, Thompson, & Theis, 2006b).

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