Instructor engagement affects student use of a Course Management System

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Introduction

• College campuses are rapidly adopting Course Management Systems (CMS) such as Moodle and Sakai for undergraduate instruction. These online support systems offer the potential to extend student-instructor interaction beyond the classroom, yet little is known about the effects of instructor engagement on student use.

• This study evaluates the extent to which instructor use of a CMS affects student use and whether increased student use results in improved academic performance.

• Participants in two intact courses taught by the same instructor used course resources available on Moodle during the course of a quarter. Level of online course support provided by the instructor was compared with levels of student use. Levels of student use were then compared with academic performance.

• **In this study, we hypothesize that instructor engagement with a CMS affects how students use the system and that this use relates to academic performance.**

Does instructor engagement with a CMS affect student use of online course resources?

Theoretical Framework

• Since CMS provides an extension of face-to-face classroom activities, student interaction with an online interface ceases to be an activity isolated from the instructor. In fact, instructors can deeply engage with their students and the course content via CMS.

• The social-constructivist approach supports this type of learning model in which students interact with instructors and with each other through multiple modes and contexts (Mayer, 2001; Jonassen, Peck, & Wilson, 1999).

• The effects of instructor engagement are reflected in students' increased use of forums and online resources when their TAs or instructors are active participants (Daley, 2002; Fahy, Crawford, and Ally, 2001; Hill, 2002).

Method

PARTICIPANTS
• 64 undergraduate students at University of California, Santa Barbara
• recruited from intact classes with same instructor
• 33 enrolled in low-support course (Spring 2005)
• 31 enrolled in high-support course (Spring 2006)

DESIGN
• Both courses taught by same instructor, used Moodle as CMS.
• In low-support course, instructor did not actively participate in online discussion forums, whereas in the high-support course, the instructor frequently participated in the discussion forums and posted lecture notes prior to each class.
• **Dependent variable: student academic performance as measured by overall course grade.**
• **Independent variable: level of online course support provided by the instructor.**
• Course grades included scores on exams and assignments, as well as in-class attendance and participation.
• **Predictor variable: interaction with online course materials as measured by (a) number of Moodle page views, and (b) responses to course questionnaires.**

Figure 1: Sample Moodle page from high-support course (2006)

ONLINE COURSE RESOURCES
• course information (assignment due dates and topic schedules)
• resources, including lecture notes, audio and video recordings of the lecture, additional readings, links to supplementary materials
• individual feedback on assignments
• discussion opportunities through forums

Results

Using the log files generated by Moodle, page views were compared with final grades. Moodle use was higher among students in the high-support group (M = 207.03) than among students in the low-support group (M = 150.88). Instructor engagement did have a significant effect on how students used Moodle, t (63) =- 3.37, p < .001.

While no significant correlation existed between Moodle use and academic performance in the low-support course, student use in the high-support course demonstrated a positive correlation between forum activities and final grade r = .431, n = 31, p < .05.

Participant responses to the post-questionnaire further support this pattern. In the low-support course, there was no significant correlation between academic achievement and level of agreement with the statement that "having a class website" was "useful in helping them learn"; yet in the high-support course, academic performance was significantly correlated with participants' level of agreement with this statement, r = .582, n = 22, p < .01. Overall, when the instructor actively used the CMS features, student use related to course grades.

Discussion

During the low-support course offered in 2005, no correlations existed between academic achievement and motivation ratings or online engagement (measured by forum use). In the high-support course offered in 2006, however, website and forum use significantly correlated with course grade. Thus, the amount of interactivity with the instructor and TA through the course website and forum discussions became the main mechanism underlying achievement. These results support earlier findings by Hoskins and van Hooff (2005) that increased bulletin board use positively influence academic achievement.

While CMS offers the potential for learning beyond the classroom, the success of these online support systems depends on instructor use. **Our preliminary findings show that the degree to which an instructor is engaged with the system directly affects student use and academic performance.**

Current Work

We are expanding upon this study in the following ways:

• **Enhanced log file analysis:** In addition to studying forum use, we are currently identifying CMS use patterns of high- and low-performing students.

• **Feedback effects:** We have added a feedback feature to the CMS so that students can see how popular each resource is among their peers. We are evaluating whether this affects resource usage.

• **Interdisciplinary study:** We are studying the relationship between instructor engagement and student CMS use across multiple disciplines, including Computer Science, Psychology, History, and Writing.

• **Increased communication:** We are also studying whether consistency in communication and resource posting plays a role in student use of the CMS.

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Effects of Instructor Engagement on Student Use of a Course Management System

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Introduction

College campuses are rapidly adopting Course Management Systems (CMS) such as Moodle and Sakai for undergraduate instruction. These online support systems offer the potential to extend student-instructor interaction beyond the classroom, yet little is known about the effects of instructor engagement on student use.

This study evaluates the extent to which instructor use of a CMS affects student use and whether increased student use results in improved academic performance. Participants in two intact courses taught by the same instructor used course resources available on Moodle during an academic quarter. Levels of online course support provided by the instructor were compared with levels of student use. Levels of student use were then compared with academic performance. In this study, we hypothesize that instructor engagement with a CMS affects how students use the system and that this use relates to academic performance.

Theoretical Framework

Since CMS provides an extension of face-to-face classroom activities, student interaction with an online interface ceases to be an activity isolated from the instructor. In fact, instructors can deeply engage with their students and the course content via CMS. The social-constructivist approach supports this type of learning model in which students interact with instructors and with each other through multiple modes and contexts (Mayer, 2001; Jonassen, Peck, & Wilson, 1999). The effects of instructor engagement are reflected in students' increased use of forums and online resources when their TAs or instructors are active participants (Daley, 2002; Fahy, Crawford, and Ally, 2001; Hill, 2002).

Method

Participants. Sixty-four students enrolled in two sections of an upper-division course at the University of California, Santa Barbara participated in the study. In the low-support course, offered during Spring quarter 2005, there were 33 participants, with a mean age of 19.74 ($SD = 1.12$). In the high-support course, offered during Spring quarter 2006, there were 31 participants, with a mean age of 21.14 ($SD = 1.35$). These distributions are typical for upper-division undergraduate courses. Students' overall grade point performance in the courses ranged from 0 to 4.0, with a mean of 3.035 ($SD = 1.05$).

Design. For this study, the dependent variable was student academic performance as measured by overall course grade. The independent variable was level of online course support provided by the instructor. We manipulated online course support for two groups: low-support and high support. In the low-support course, the instructor did not actively participate in the online discussion forums, whereas in the high-support course, the instructor frequently participated in the discussion forums and posted lecture notes prior to each class. Course grades included scores on exams and assignments, as well as in-class participation. The predictor variable was interaction with online course materials, as

measured by (a) number of Moodle page views and (b) responses to course questionnaires. Page views on Moodle were categorized as: home page, forums, assignments, supplementary resources, grade views, and student profiles. In addition, participants responded to pre- and post-course questionnaires regarding their attitudes toward technology use within and beyond the classroom. Questions ranged from asking about frequency of personal use of Instant Messaging and cell phones to whether the use of PowerPoint in their current class was helpful. In addition, participants were asked about their learning practices, specifically, their motivation for taking the course, when and how they study, and level of interest in the course topic.

Online course resources. For the low-support and high-support courses, the instructor elected to use Moodle as a way of extending interaction beyond the classroom. Although Moodle use was not directly tied to their grade, all students were expected to register with Moodle during the first week of class and were encouraged to visit Moodle regularly for course updates, grade postings, and assignment feedback. Audio and video recordings of the lectures, as well as scores for the daily exercises were posted to Moodle immediately following the lecture. In the high-support course, prior to each lecture, the instructor posted PowerPoint slides that students were encouraged to print and bring to class to facilitate note-taking. During the lecture, the instructor projected these slides onto a whiteboard and annotated them with notes, diagrams, and examples.

In addition to integrating course resources posted on Moodle into his lecture, the instructor used Moodle as an information portal for the class. The following resources were available for students to access via Moodle:
  (1) course information, including assignment due dates, topic schedules, and grades;
  (2) resources, including lecture notes, audio and video recordings of the lecture, additional readings and links to supplementary materials;
  (3) individual feedback on assignments;
  (4) discussion opportunities through forums.

Results

Using the log files generated by Moodle, page views were compared with final grades. Moodle use was higher among students in the high-support group ($M = 207.03$, $SD = 78.008$) than among students in the low-support group ($M = 150.88$, $SD = 55.156$). Instructor engagement had a significant effect on how students used Moodle, $t(63) = -3.37$, $p < .001$. The effect size is $d = .85$, which is considered a large effect.

While no significant correlation existed between Moodle use and academic performance in the low-support course, student use in the high-support course demonstrated a positive correlation between forum activities and final grade $r = .431$, $n = 31$, $p < .05$.

Participant responses to the post-questionnaire further support this pattern. In the low-support course, there was no significant correlation between academic achievement and level of agreement with the statement that "having a class website" was "useful in helping them learn"; yet in the high-support course, academic performance was significantly correlated with participants' level of agreement with this statement, $r = .582$, $n = 22$, $p < .01$. Overall, when the instructor actively used the CMS features, student use related positively to course grades.

Discussion

During the low-support course offered in 2005, no correlations existed between academic achievement and motivation ratings or online engagement (measured by forum use). In the high-support course offered in 2006, however, website and forum use significantly correlated with course grade. Thus, the amount of interactivity with the instructor and TA through the course website and forum discussions became the main mechanism underlying achievement. These results support earlier findings by Hoskins and van Hooff (2005) that increased bulletin board use positively influenced academic achievement.

Although CMS offers the potential for learning beyond the classroom, the success of these online support systems depends on instructor use. Our preliminary findings show that the degree to which an instructor is engaged with the system directly affects student use and academic performance.

References

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