Improving Web-Based Learning by Using Improved and Well Designed Course Management Systems

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Abstract: Web-Based Learning (WBL) has increased dramatically in the past 10 years. Issues facing WBL include learner needs, instructional process, issues of access, and the changing roles of teachers and students. Instructors' ability to address these issues is largely dependent on the software technology used to develop and deliver the online courses. Course management systems (CMSs), like WebCT and Blackboard, are the mediums of choice for developing and delivering online courses in recent years, serving thousands of K20 schools worldwide. Good course design is essential in WBL, but limited by the technologies used. Distant teaching and learning can be as effective as the traditional face-to-face when assisted by well-designed technologies. The purpose of this paper is to explain how to improve distance education by improving CMSs. We need to take a critical look at tools like WebCT and Blackboard and recommend improvements that may improve student learning experiences.

Distance Education (WBL) has increased dramatically in the past 10 years. What was once considered a form of education provided by a few national universities is currently ubiquitous across all levels of education. Results from a 2002 survey of 75 college distance learning programs showed astounding growth in the higher education distance learning market reporting 41% mean annual enrollment growth rate (Primary Research Group, 2002). Analysts such as Bishop, Dunn, and Winsboro (as cited in Howell, Williams, & Lindsay, 2003) have asserted that most of traditional campus programs will be available (alternatively or exclusively) online in the next several years. The community of K–12 education has also seen explosive growth in distance learning programs over the last decade (Cavanaugh, Gillan, Kromrey, Hess, & Blomeyer, 2004). The ever-growing number of students learning online has increased the need to address the challenges associated with WBL to ensure quality of learning and learner satisfaction.

What We Know About Online Instruction

A variety of technologies (e.g., television, video, and computer) have been used as delivery systems for learning at a distance. Much of the early research focused on comparing the effectiveness of one distance delivery medium over another, in particular comparing teaching at a distance using delivery media, with traditional face-to-face teaching (McIsaac & Gunawardena, 1996). Most of these "media comparison studies" found no significant differences in learning. Clark (1984) argued that "Learning gains come from adequate instructional design theory and practice, not from the medium used to deliver instruction" (p. 3). In a recent review of distance courses since 1985, Bernard et al. (2004) established that student achievement and satisfaction in distance education courses is no different from students in traditional classrooms.

During the 1990s, as Web-based communication tools and personal computers became more powerful, the emphasis in distance education research, shifted somewhat from discussions about the delivery medium to pedagogical themes such as design issues, instructional process, strategies for active learning and interaction, learner needs, and the changing roles of teachers and students (Berge & Mrozowski, 2001; Saba, 2000; Shery, 1996). This shift was possibly in part due to the realization that Clark (1984) and others was correct about the futility of media comparison studies, but it also is an indication that no matter how powerful the delivery technology became, old challenges like feelings of isolation, frustration, and lack of feedback persisted. McDonald and Campbell Gibson

(1998) studied the interpersonal communication and social exchange among graduate students in distance courses and found that the patterns of social exchange in asynchronous online discussions progress through stages similar to those of students interacting face to face. The researchers suggested that interpersonal issues are crucial at the beginning of the course, and online instructors need to model openness, warmth and expressions of feeling to help create a trusting learning environment when asynchronous communication is used. Moller (1998) stressed the role of "presence" and "being there" in his work in asynchronous web-based environments. He defined "social presence" as "the degree to which an individual feels or is seen as real by colleagues working in the online context." According to Moller, when a learner has a higher degree of social presence, he or she is more likely to feel connected to the group, which leads to greater satisfaction and reduces the likelihood that the learner will leave the environment.

In a series of case studies, Hara and Kling (1999) examined college students' frustration with online courses and found that the main causes of students' frustrations were: technological problems, minimal and untimely feedback from instructor, and ambiguous instruction. In addition, students experienced anxiety related to falling behind in reading messages and difficulty with dealing with information overload. Moreover, they felt that they spent more time than anticipated online. Some students also experienced feelings of insecurity about their progress because of the lack of the instructor's physical presence. Hara and Kling concluded that these frustrations inhibited educational opportunities. Childers and Berner (2000) argued that isolation can also be felt by instructors who are separated from their students. The authors observed that the feeling of isolation affected instructor's satisfaction, motivation, and potential long-term involvement in distance learning. Haythornthwaite, Kazmer, Robins, and Shoemaker (2000) underscored the importance of social interaction establishing the sense of community in online courses to enable members to work together, to share goals, and to provide support. The researchers argued that learners need time to become socially engaged so that they can "move from a stressful position of isolation to confident membership." Chou (2001) examined synchronous computer-mediated communication in an online course using the authoring system WebCT, among other tools. Her recommendations included that instructors should provide continuous guidance and support, be responsive, provide individual coaching, demonstrate a positive attitude and good relationship with students, be accessible, and provide immediate feedback.

To state the obvious then, quality interaction (both learner-instructor and learner-learner) is essential in distance learning courses; it motivates learners and provides opportunity for social negotiation, while diminishing feelings of frustration and isolation. However, "rich" asynchronous communications can result in information overload and cause workload for instructors and learners (Hara & Kling, 1999). Collis, Winnips, and Moonen, (2000) suggested that providing more support in the form of required online communication, discussion, and feedback prompted students to spend more time on the course but did not necessarily influence student achievement. Moreover, research on instructors for web-based and traditional courses, conducted by the National Education Association (NEA, 2000) showed that half of the instructors spent more time per week preparing and delivering their web-based courses than they did for their traditional courses.

Course Management Systems

WebCT and Blackboard are currentlyy the world's leading providers of integrated e-learning systems, serving (together) more than 3,700 colleges and universities in more than 70 countries worldwide (WebCT.com, 2005; Blackboard.com, 2005). Course Management Systems (CMSs) have become the delivery medium of choice for WBL in recent years. CMSs integrate technological and pedagogical features of the Internet into a well-developed system. Common features in most CMSs include content areas, discussion boards, chat rooms, assignment drop boxes, quizzes, and surveys, and white boards. CMSs allow instructors unfamiliar with web-based teaching to design, deliver and manage an online course. They support student – teacher communication and collaboration. Students are better able to share resources, collaborate, participate in forums, take online tests, upload files for the teacher to grade, and access their grades. Because of technologies like CMSs, universities can make courses and content accessible to busy adults, and K-12 students alike. whoCMSs are used in the majority of colleges and universities and have grown in popularity the K-12 world, being used by many K-12 virtual schools (EduTools, 2005). The need for effective course-management systems is obvious, but good course design is limited by the tool used to develop the courses.

Statement of the Problem

Recent critiques of CMSs have revealed some pedagogical and technological concerns; although no adequate feedback is provided about their potential improvements. Marra and Jonassen (2001) concluded that CMSs lack the ability to support multiple forms of knowledge representation, authentic forms of assessment, and knowledge construction. Oliver (2001), based on a existing online tools, argued that CMSs are more faculty-oriented dissemination tools than student-oriented learning tools. According to the author, a threaded discussion forum, for instance, is a communication tool but not a learning tool per se. Oliver also concluded that CMSs cannot adequately support multimedia (e.g. audio, video, animations) and therefore instructors lacked the ability to develop realistic authentic cases and tasks. Dabbagh and Bannan-Ritland (2005) argued that authoring tools such as Dreamweaver and FrontPage may be more appropriate for developing online courses integrating multimedia. Furthermore, Dabbagh (2000) contended that uploading documents to the student assignment areas in WebCT was frustrating for students because of the "unintelligent" procedure. Likewise, Harvey and Lee (2001) reported that the CMSs interface was not designed according to instructional design principles and that some of the icons could be misleading to some students.

Wagner (1990) claimed that as instructional delivery systems become more powerful and complex (i.e., interactive television, computer-based instruction, and teleconferencing) it is important for users to be increasingly selective when using them. As the number of K-20 students using web-based courses increases, schools will need not only more qualified instructors in web-based learning, but also improved and more efficient CMSs. We encourage all users to critically evaluate tools like WebCT and Blackboard to determine what improvements might improve online experiences.

Effective WBL involves not only an instructor/learner issue, but is a three-way Instructor-Learner-CMS interaction. Instructors' ability to address issues of WBL (such as learners' feelings of isolation, frustration, and lack of feedback) is largely dependent on the CMSs used to develop and deliver the course and the vendors who build them. It is as important to put the right tool in both instructors' and learners' hands to ensure effective online teaching and learning. CMSs have helped overcome much of the technical difficulties of WBL; however they still need improvements to help address pedagogical concerns and learner needs. The purpose of this paper is to explain how to improve WBL by changing some features of the CMSs. The paper will provide suggestions on how improvements to CMSs can increase learner-learner and learner-instructor interaction, motivate online learners, reduce the workload for both learners and instructors, and result in more successful online experiences.

Improving Course Management Systems

Following are five practical recommendations to improve CMSs that could mitigate some of the problems frequently cited by users.

CMSs Should Run as a Local Client Application, Independent from the Web-browser: Like all web-delivered applications, CMSs are currently based on a web client-server model. All users need are a computer, Internet connectivity, and a browser to access CMS features. CMS client applications would have to be installed locally on user machines, but they would still be able to access the online course away from their personal computers. Some existing client applications that successfully facilitate communication over the web are: email clients (e.g., MS Outlook, Eudora), and instant messengers (IM e.g., AOL, Yahoo). With existing web-based CMS participants must remember to check the online course area regularly for new postings, since there is no e-notification for new events. This process also involves a login action which users have to repeat when their session ends (every 30 minutes). This is time consuming and unnecessary if there is nothing new posted; while on the other hand, when there *is* something that needs attention, users might miss it right after they sign out of the system. A client application would enable 'transparent' login to the CMS system without user notice. Thus, users would be able to work on other tasks on their computers, as the CMS local application would run in the background in communication with the online course (server). New events would be announced to the users right away, including postings or updates in the discussion board, calendar and syllabus, as well as who is available on the online course area. Hence, instructors could respond to their students' postings on a timelier basis, just like they would do with their emails or IM. On the learner side, learners would get timelier feedback on posted questions or contributions and should experience less anxiety (Hara & Kling, 1999) associated with falling behind reading the messages and less frustration and feelings of isolations (e.g. Childers & Berner, 2000; Haythornthwaite et. al., 2000; Moller, 1998). Discussion would take place all day long, allowing more time for reflective thinking and developing a real sense of community.

CMS Should Provide a Flexible Interface That Allows Users to Customize the Application to Meet Specific Needs: Dix, Finlay, Abowd, and Beale (1993) argued that it is not enough to have a system accessible for all users;

that users should have control over the tool and be given the opportunity to impose their own structure on the way the information is presented according to their specific needs. In existing CMSs instructors have some control over the interface of their pages, while learners have none. A client application would be user-customizable to fit users' individual needs at their ends, like other client applications such as email and IM. For example, users would be able to change themes, font sizes, and icons, to add reminders on their calendars, to enable spelling and grammar tools when they craft a posting, to perform drag-drop/ copy-paste operations, to be provided with dynamic help (e.g., Microsoft Office Assistant). A user-friendly interface would also involve more meaningful procedures and relevant icons. For instance, the process of uploading documents in WebCT, described by Dabbagh (2000) as an "unintelligent" and frustrating procedure, should involve more reasonable and clear steps like drag-drop or copy-paste operations. Existing client applications might be so successful and popular because of their user-friendliness and customizability.

CMSs Should Provide Space for Personal User Profiles: Hara and Kling (1999) found that lack of cues in the online environment was related to student anxiety. Some students reported having trouble interpreting their classmates' messages or clarifying their instructor's expectations because they didn't know each other's personalities and backgrounds. Sometimes jokes were misinterpreted. Perhaps this could be alleviated if learners and instructors could share personal information like pictures, status, interests, personal work and personal websites with the others. Flexible profiles would allow learners to choose to remain anonymous, or use nicknames, or to show their profiles to some of their classmates but not to others, during the online discussions. Profiles availability would definitely reduce misconceptions and feelings of isolation while it would increase the sense of community in online courses.

CMSs Should Provide Motivational Features: The motivational factors arising from the competition among students and the presence of an inspiring instructor is often absent in a distance learning course, especially when interaction (learner-learner, learner-instructor) is limited (Galusha, 1998). Enriching CMSs with educational interactive team games or quizzes (e.g., Sudoku, Crossword) would promote enjoyment and fun in the online environment. Learners might be motivated to visit the online course more frequently to participate in the team games with their classmates, and get to know each other better. Hence, including team games and quizzes in the environment might not only increase motivation but also decrease feelings of isolation (e.g. Haythornthwaite et. al., 2000; Moller, 1998). Moreover, getting students in the course area for games would potentially make them also visit other places including the discussions area, course materials, and class schedule. Instructors could take advantage of these motivational features of the CMS to reinforce student participation and collaboration. For instance, the instructor could make next level of the game available only when all students have submitted their assignments and contribute to the online conversations. Instructors should also be able to use CMS features to create their own interactive games/ quizzes for their students. The instructor, for example, could craft some quiz questions in a database and have the CMS generate a crossword puzzle from those. Then learners might access the crossword-quiz and work on the solution collaboratively. Multimedia/hypermedia such as text, sound, video and animation could also motivate students and increase positive attitudes toward learning. Weber (1996) observed that multimedia presentations are more successful than lecture with motivating student to learn. However, according to Oliver (2001), existing CMSs do not adequately support multimedia tools. Vendors who build CMS's should consider improving mu ltimedia accessibility for their customers, allowing instructors to easily incorporate flash animations, audio, and video files in their web pages.

CMSs Should Be Synchronized With Global Libraries, Dictionaries, Encyclopedias and Multimedia Resources: CMSs vendors should ensure that the latest versions of their products are compatible with the recent innovations such as the Internet2 backbone network (Internet next generation). Today the National Internet2 K20 Initiative brings together Internet2 member institutions and innovators from primary and secondary schools, colleges and universities, libraries, and museums to extend new technologies, applications, and content to all educational sectors, as quickly and connectedly as possible (internet2.edu, 2005). Distance educators and learners should be able to use CMSs to take advantage of the myriad resources available in the Internet2 secure network, for constructivist distance learning experiences.

Conclusions

The emergence of technology and WWW as a delivery system has provided endless learning opportunities. Online courses can provide access to resources not available in the traditional classroom and can overcome time and place constraints. Learning experiences, such as accessing global resources, pairing experts from around the world with novices, offer exciting possibilities. But the technology's affordances and limitations highly affect the quality of the

instruction (Kozma, 1994) and even in some respects, limit the vision of the instructor. Web-based instruction can be effective in providing unique learning experiences when assisted by well-designed CMSs. It is essential to continually improve not only WBL teaching practices, but also other relevant technologies used to develop and deliver online courses. A comprehensive examination and use of CMSs can yield effective instruction that takes advantage of the inherent features of the Web.

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