COLLABORATION AND INTERACTION AS THE MAINSTAYS OF AN IMPROVED LEARNING MANAGEMENT SYSTEM

Brian Mackie, Northern Illinois University, bmackie@niu.edu

ABSTRACT

*There are many commercially available online class management systems (OCMS) or learning management systems (LMS). Most have been developed to manage the data for a class and to track the participants' activities. Very few have centered their efforts on making the environment participant friendly. Even fewer have sough to create an environment where the participant is encouraged to be an informed contributor for the community. Most systems are designed so that the participant merely logs into the system to learn when an assignment is due, download an assignment or other information, take a survey, quiz, or test, and then log off the system. This is a failure to foster a constructive learning environment. The following paper describes the development and maturation of an OCMS that was engineered designed to be participant centric, to allow a large degree of interactivity, and to allow participant ownership of information within the system. Many of the features incorporated in the system give the participant reasons to remain engaged and even to contribute to the system – as opposed to merely lurking in the background. The "informal and reciprocal knowledge exchanges between individuals are valued and sustained over time because the sharing of knowledge is an important aspect of being a member of a technological community" [8]. We developed an innovative system entitled "Community/course Action/interaction Management System" (CAMS). The link to it (**http://cams-community.com/cams/trial_entry.php**) will automatically log you into a demonstration community called Class Example. It allows up to thirty-one people to enter the community at the same time and try out the system. This demonstration community gives each person a distinctive identity and even includes a unique fake picture for each participant.*

Keywords: Online Communities, Online Collaboration, Interaction, Participant owned, User centric

INTRODUCTION

Developing an online Learning Management System at first glance would seem like a futile effort since there are many Learning Management Systems (LMS) already available. It would seem initially that another system could do little but yield more of the same. That would be true if the system was not conceptually different. Most LMS systems have the same basic set of features. However, imagine if these features were tailored to allow participants to own/update their own information within the platform and to interact with other community participants. CAMS (**C**ommunity/course **A**ction/interaction **M**anagement **S**ystem) was custom created as such a participant centric collaborative system. This was done in response to the trend that "many young people now live in an e-learning world" [4]. This paper is broken into three parts. The first part is "The Evolution of CAMS." This section describes the transformation from a product implemented using proprietary programs and tools to a program developed using open source programs and tools. The second part is "The Overview of CAMS," which includes many of the useful features and the benefits of those components, with an emphasis on aspects that are interactive and/or owned by the participant. The following paper outlines the future of CAMS,

including some new tools yet to be implemented, as well as the potential for innovations in other OCMS systems.

EVOLUTION OF CAMS

CAMS was originally developed by one faculty to assist other faculty in implementing an online grading system. The developer added pictures of the students/participants to give the participants a sense of ownership of their information and a sense of community [5]. That original system was so well received that it was decided to expand the system to handle many of the features of an LMS. The developer polled several classes as to what functions a good LMS system should incorporate and what drawbacks had been encountered in other LMS programs.

Using the information gleaned from these classes along with his own ideas, the CAMS inventor recruited a group of graduate students to work with him in developing a unique LMS that focused on collaboration, interaction, and was participant centric. One major difficulty participants had found with other LMS programs was their inability to allow campus based non-class groups to use their system to interact online. It was also decided to emphasize the ability of the system to allow users to interact online and to allow each group to incorporate/deploy only those features that were most useful to them. Please see Table 1 for a comparison of CAMS with two of the major LMS Programs, Blackboard and WebCT.

Table 1. Comparison of Features

	CAMS	Blackboard	WebCT
Picture/Avatar Identification	In most features	In Picture-book	Can add pictures
Search capability	In most features	Limited	Limited
See What's New	Automatic	Limited & manual	Limited
Those Online	In most features	Very limited	Very limited
Test Grading - one question for all students at one time	Yes	No	No
Rubric grading as a choice	Yes	No	No
Bookmarks added by students	Menu Choice	Limited	Limited
Buddy-list	Menu Choice	Limited	Limited
Personal Notes	Yes/Searchable	Limited	Limited
Instant Message	Menu Choice	Limited	Limited

It was decided that the system should focus on group interaction and on being participant centric, as opposed to being facilitator centric. The capability of an LMS to allow participants to interact with the system and collaborate with one another cannot be stressed enough. The system (see Figure 1) was developed Summer 2001. It had the standard LMS features including assignments, notes, testing, and grading. The system readily gained acceptance, and both facilitators and participants were sharing recommendations on system features to be added or improved upon. It is interesting to note that some facilitators initially felt slighted since the system was to be participant centric instead of facilitator centric. Then it was explained that since the facilitators were participants, their needs would also be met.

Figure 1. Main Community Page in Original CAMS System

CAMS evolved over the course of approximately two years from a fairly simple grade reporting system to a full-scale Online Community/course Management System (OCMS). The screen displayed in Figure 1 depicts what a participant would see upon entering a CAMS community. Here each participant was displayed including picture, phonetic spelling of his/her name, link to preferred email address, link to Instant Message (IM) the participant, link to participant's web presence and a link to information about the participant. The system incorporated an easy to use menu at the top of every page. At the bottom of each page was a display of the pictures of all participants online at that time. One participant centric feature was a real-time chat system that displayed the pictures of the chat participants with each message they sent. All chat messages could be searched at any time by date and/or content. An Instant Message feature was incorporated, in response to the trend that Instant Messaging has become integral in workflow management [1]. One could simply click on the picture of a participant to send an Instant Message to that participant. A bookmarks feature was also added. Here, either the facilitator or participant could add bookmarks to useful websites for the community. Each bookmark included the web address, a title for the link, and information about the link. In addition, each bookmark displayed the picture of the participant who created the link. When one clicked on the link the website would open in another window. Figure 2 shows the participant personal planner that was added to the system. The participant could add or edit events on the calendar. It also displayed assignments due on a specific date. All assignments for all communities a participant belonged to were displayed in the same personal planner.

Figure 2. Personal Planner / Calendar

The system was originally written using Active Server Pages (ASP). These pages were then used to talk to the backend which was a database developed in Microsoft SQL Server. The system was deployed on a Windows Server using Microsoft's Internet Information Server. After approximately two years of use and numerous modifications and additions to the system, it was determined that for the system to continue to grow at the extreme rate it had since its inception, it needed to be totally rewritten.

There were two realistic possibilities. One was to convert the system to ASP.net and keep it working only on a *Windows* environment. The second was to rewrite the system using open source products and allow it to run on multiple platforms. The developer decided to redesign the system using open source for multiple platforms. It was decided to rewrite the system using PHP for the front-end and develop the back-end database using MYSQL. The system would be run using the Apache web server instead of IIS. It was also decided that since the system was being moved to another platform, any new ideas should be incorporated throughout on all pages. This entailed porting the pages to the new system and then rewriting the code to incorporate these new ideas, instead of just porting the original pages from one system to the other, which would have been much easier to implement. The redevelopment of the system was undertaken Summer 2004, and the original system continued to be used during that term. Once the system was rewritten, the communities and all the data were moved from the original system to the new system. The system was switched over in August 2004. The system is now gaining new features at a pace more rapid than the original systems development of CAMS. The system uptime is approximately 99.997%. There is very little administrative support needed on the system. CAMS is currently running at two universities and will be fully implemented at a local high school in the fall. Faculty from three other universities plan to use CAMS Fall 2005.

OVERVIEW OF CAMS

The following is a partial list of collaborative and interactive features incorporated into CAMS: Instant Messaging, Personal Note Taking, Buddy Lists, Real-Time Chat, Testing, Project Management, Project Chat, Threaded Discussions, Article Research, Bookmarks, Search features (available in most areas), Personal Links, and the ability to personalize participant's page view. The sections below will describe the features mentioned in the respective section headings.

IM and Buddy Lists
Both the IM and Buddy List features work together. Participants can send an instant message to anyone in the community using IM. If the other participant is online, the message will be received within 30 seconds (see Figure 2). If the other participant is not logged into CAMS and has opted for the feature, the IM will be transferred as an email. The Buddy List allows the participant to create a list of friends that are in CAMS, whether or not the friends are enrolled in the same community. The participant can go into the system and search for their friend. Once found they can request that the other participant join their buddy list. The other participant will then receive an IM requesting to add this participant to his/her buddy list. If that request is accepted, both users can IM each other by going to the buddy list and clicking the IM for that user (see Figure 2).

Personalized Notes
A participant may take notes and upload files for any of his/her communities and store that data in one area. He/she can create folders up to 5 levels deep to store those notes and files into. At anytime these notes can be searched by content (see Figure 3).

Figure 3. Personal Notes, Buddy List, IM and Instant Message Received

Real-Time Chat
The Real-Time Chat feature includes the following three panes (see Figure 4): (A) message entry, (B) display of messages in order from newest to oldest, and (C) display of messages in order from oldest to newest. It is easy to keep track of messages by using pane B to track the new messages coming in and pane C to read complete messages. A chat among 20 or more participants is realistic and plausible. This is normally very difficult to facilitate in conventional real-time chat systems [7]. Also, all messages are archived so participants can look up messages by date and content, as well as see the picture of the author by clicking on Chat Search.

Figure 4. Real-time Chat

Testing
The Testing feature was designed so that once a test was completed, the facilitator could grade one test per student or grade one question for all students. The rational was that the latter method may encourage more fairness in grading. While the question is being graded, the facilitator can mark certain answers as being correct and viewable. The participant can then view his/her answers to the questions with points received, facilitator comments, and those answers the facilitator marked as either correct or the best answer. Participants find the feedback and correct answers useful in understanding what they did wrong and how to correct their mistakes. "Two-

way fast feedback leads to never-ending improvement of teaching and learning via correction of teaching flaws reported by the students" [3]. Facilitators can also allow students to create questions that the instructor can incorporate into tests.

Project Management
The Project Management area allows groups to be created for team or class projects. These groups can create notes for their projects and upload files to their project areas. They can create folders up to 5 levels deep to store their notes and files. They also have the chat system described earlier, which is then accessible to group members only. The group also has the ability to allow their notes to be viewed or searched by everyone. The facilitator can enable participants to create groups and allow participants to enroll themselves into a group.

Threaded Discussions
Threaded Discussions allow the facilitator and participants to engage in dialogue. Once again, messages can be stored in folders up to 5 levels deep. The facilitator can restrict a thread, which allows everyone to see who has sent a message and the title of the message but only the facilitator and the message author can read/update the message.

Personalization of CAMS Display
The facilitator can set the background color, text color, font and font size for a community. The participant can override all of the above settings to personalize his/her own CAMS experience for the communities they belong to.

Search Feature
The following pages in CAMS –most of them- include the Search Feature: Home, Assignments, Notes, Personal Notes, Schedule, FAQ, Threaded Discussion, and Bookmarks. All of those pages can be searched by title, content and date.

Those On-line
The system displays those participants on-line within the community at the bottom of all pages. One participant can click on the picture of another participant who is online within the community in order to send an instant message.

See What is New
The participant can go to "See What Is New" to display assignments, notes, schedules, and personal events that have been modified in the last day or occurring within the next two days for all communities they belong to. This information is displayed within this community for all communities the participant is enrolled in. Also, the participant can elect to have CAMS send the participant updated information for all of his/her communities once a day.

THE FUTURE OF CAMS AND OTHER OCMS
When the current version of CAMS (see Figure 5) is compared to the original version of CAMS (see Figure 1), many features that have been added to CAMS become evident. Each semester yields new field requests for innovative improvements to the system. The incoming requests are continuously evaluated as to how they might fit into the overall system and increase the collaboration and interactive features of CAMS. Most recently, Buddy List was added to give

participants access to other users of CAMS so they could IM anyone in the system instead of just participants in those communities they belong to. Currently under investigation is the potential to expand Buddy Lists to allow a participant to send an IM to a group of buddies.

Figure 5. Home Page for Current CAMS Version

The CAMS development team is looking at ways to implement additional synchronous collaborative features. The team is also evaluating the potential of incorporating a whiteboard in the system and the addition of voice to instant messaging. These are only two of the several potentially new features under review.

It has been asked why other OCMS's have not incorporated more collaborative features and increased participant interaction. There are newer OCMS's that are adding more participant centric features. The best known OCMS systems were originally written with an emphasis on course management and very little focus on participant interaction. These systems have begun to add features that incorporate some level of interaction; however, these systems are merely adding features and do not have a design centered on the participant. The CAMS team hopes that other OCMS systems will incorporate features similar to those found in CAMS, because the team believes CAMS truly helps to increase community and collaboration in the online platform. In fact, several participants have recommended renaming CAMS as "**C**oll**A**boration **M**ade **S**imple." This is important because "learning via technologies has increased steadily since 1999 as classroom-based learning has decreased" [2]. Not only has such technology-enhanced learning increased, it also offers a variety of advantages. According to Connie Gentry's Learning on demand, online courses suggest several advantages over classroom based learning, such as being readily accessible 24/7, deliver more consistent quality of instruction, and resulting in a higher learner retention rate [6].

REFERENCES

1. Adkins, S. S. (June 2003). The Brave New World of Learning, *T&D*, *57*(6), 28-38.
2. Anonymous (May 2005). Less Classroom, More Technology, *T&D*, *59*(5), 24.
3. Bateman, G. R. & Roberts, H. V. (Oct 1995) *Quality Progress*, *28*(10), 168.
4. Bray, R. (October 2004). The digital blackboard. *Summit*, *7*(6), 12.
5. Franklin, C. (2001, October 8) Are face-to-face interactions crucial? *InternetWeek,* 20.
6. Gentry, C. R. (June 2005). Learning On Demand, *Chain Store Age*, *81*(6) 58-59.
7. Marjanovic, O. (1999). Learning and teaching in a synchronous collaborative environment. *Journal of Computer Assisted Learning*, *15*(2), 129-138.
8. McLure, W. M. & Faraj, S. (March 2005). Why Should I Share? Examining Social Capital and Knowledge Contribution in Electronic Networks of Practice. *MIS Quarterly*, *29*(1), 35.