
SOFTWARE REVIEW

Software for Supporting Web-Based Instruction: A CourseInfo™ Case Study

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INTRODUCTION

Over the past few years, many university faculty members have realized the potential of the Internet as a means for enhancing teaching and learning. They have created course web pages and made use of other Internet applications such as mailing lists and chat rooms to enhance their courses. While this is a good start, alternatives that provide these services in an integrated environment are now available.

Several excellent software applications for supporting web-based courses have emerged recently. Most of these share a common set of features such as an on-line grade book, support for testing, course statistics, chat room and message board services, course calendars, and various communication tools. Three examples of software applications for supporting virtual classrooms

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are WebCT, TopClass™, and CourseInfo™ (1-3). These applications make the process of placing course materials on-line easy even for novice computer users. They offer exciting possibilities for enhancing traditional classes as well as for delivering courses entirely through the World Wide Web (WWW). The potential benefits include:

- Increased communication among course participants
- The availability of electronic forums which engage students
- A means for supporting self-paced, just-in-time learning
- Increased accessibility and convenience for students and instructors
- A way to bridge geographical barriers.

Pharmacy faculty at the University of Mississippi (UM) realized the potential of integrated applications for supporting web-based courses early on. While some faculty planned to use this software in courses that would be taught entirely on-line, most wanted to use the software to enhance traditional courses. To choose the most useful software package for the university, a selection and review process was initiated. This article describes the evaluation process that was used to select an application and reviews the initial experiences of students, faculty, and support staff with CourseInfo, which was the application selected.

THE SELECTION PROCESS

The investment in faculty time and effort to develop on-line course materials requires that institutions carefully consider the available options and choose wisely. Toward this end, in spring 1998, a cross-discipline team of UM faculty and Information Technology (IT) support staff was established to evaluate alternative applications for supporting web-based courses. Most of the faculty were looking for web-based tools to complement in-class experiences. Most of the faculty were already placing syllabi, assignments, presentations, and other resources (for example, lecture notes in PDF format) on-line. Education and pharmacy faculty were facing the challenge of teaching mostly adult learners who had active professional lives that made travel to day classes at the university difficult. They sought to reduce the number of face-to-face meetings by using alternative electronic formats. Several of the faculty noted previous successes with electronic communication as a means for promoting positive interaction among students and hoped to make further advances with these technologies. The team noted that students had responded positively to increased electronic forums thus far and especially liked being able to look up their grades on-line. Some of the faculty had

successfully used web forms as a means for allowing students to evaluate their experiences. Pharmacy faculty were seeking more ways to promote and support problem-based learning (PBL), an important part of the School of Pharmacy curriculum. IT support staff were looking for tools that would make putting courses on-line very easy for those faculty who could not afford to invest time learning about Hypertext Markup Language (HTML).

The team identified the applications that were available at that time, collected information on the features of each application and product reviews, and then set a goal of narrowing this list down to five or fewer alternatives. Table 1 shows some of the applications that were considered in the first round.

At this point, the team members read reviews, visited the product web sites, and submitted their top three choices. Several team members contacted colleagues at other universities who were using these applications. As part of this process, the faculty commented on qualities such as the user interface (e.g., the organization of class content), the availability of various features (e.g., on-line quizzes and chat rooms), and the ease of authoring. The results were compiled and the original list was culled to TopClass, WebCT, and CourseInfo.

IT staff then obtained demonstration versions of each of these applications and installed them on a local web server. An instructional design specialist set up a sample course module in each package and presented her experiences to the team. IT staff contacted customers who had used the three packages to find out about support issues. Finally, the team members themselves experimented with the locally installed versions of each package.

The team agreed to use the following criteria in the next evaluation step:

TABLE 1. Software for Supporting Web-Based Courses.

Product	URL
Asymetrix	http://www.asymetrix.com/products/toolbook2
CourseInfo	http://www.blackboard.net
CyberProf	http://cyber.ccsr.uiuc.edu/cyberprof/
Instructional Toolkit	http://toolkit.virginia.edu/cgi-local/pm/class/.tkdocs/displaydocs
LearningSpace	http://www.lotus.com/home.nsf/welcome/learnspace
LearnLinc	http://www.ilinc.com/
Oracle Learning Architecture	http://ola.us.oracle.com/html/welcome.html
Serf	http://www.udel.edu/serf/
Share Carolina	http://www.unc.edu/courses/ssp/share/
TopClass	http://www.wbtsystems.com/
Virtual-U	http://virtual-u.cs.sfu.ca/vuweb/
Web Course in a Box	http://www.madduck.com/wcbinfo/wcb.html
WebCT	http://homebrew1.cs.ubc.ca/webct/
WebMentor	http://avilar.adasoft.com/avilar/index.html

ease of use, ease of support, support for a variety of on-line formats, support for testing, long-term viability, cost, and features. Each team member rated the products on a scale of 1-5, with 5 being the best. At the time of purchase, the costs for the top three products were comparable, with WebCT at \$3000 for a 12-month unlimited single server license, TopClass at \$4750 for a 12-month 200 simultaneous user license, and CourseInfo at \$5000 per server per year. Table 2 summarizes the voting results.

The University of Mississippi ultimately chose CourseInfo, and faculty began using it in spring 1999.

RESPONSE FROM FACULTY

The decision to implement a web-based course delivery system is an ambitious one. It means not only selection and financial and technical support but also negotiating the precarious balance between what the faculty *want to be able to do with the software package* and *what the software package can realistically do*, the difference between the two defining the success of both the software and the project itself. In an effort to gauge how successful the implementation of CourseInfo has been at the University of Mississippi, we recently sent out an e-mail survey to all faculty and instructors. We posed five questions to assess the range of effects CourseInfo is having both technically and pedagogically with participating faculty members. We hoped for a broad-spectrum analysis, and the questions ranged from assessing utility of the software to pedagogical implications of the software to deficiencies in the software package itself.

Below are the questions and an abridged list of responses we received.¹ As we reviewed the answers submitted, we saw a definite pattern emerge—even amidst the occasional criticism and complaint. Overall, faculty and instructors using the software were pleased by their own and their students' interaction with the software. They felt that the time and effort they invested in using the software was well spent and that this tool, which may not solve every pedagogical problem, was a valuable addition to their teaching arsenal.

TABLE 2. Voting Results for Web-Based Courses.

Product	Ease of Use	Ease of Support	Support for a Variety of On-Line Formats	Support for Testing	Long-Term Viability	Cost	Features	Total Score
WebCT	2.71	2.714	3.71	3.86	2.71	4.43	3.29	3.345
TopClass	3.86	4.29	4.14	4.14	4.43	3.714	4	4.08
CourseInfo	4.71	4.57	4.14	4	4.29	3.86	4.14	4.24

Question One: What features are most useful to you in CourseInfo?

- “Being able to put something out there without having to know programming”
- “the survey feature”
- “I find that the on-line grade book, with each student able to check only their grade, the most useful feature, and one that I could not duplicate when I had a course homepage”
- “very easy to upload files!!!”
- “No need to prepare ambitious HTML documents.”
- “Being able to post announcements and assignments, the ability to just upload files to the assignments section. I mainly find that it is extremely helpful to have the announcements visible immediately and to post quick updates or adjustments or news to the site.”
- “grades are posted on-line immediately, grades [on-line] quizzes for you, easy to e-mail or contact students”
- “Assignments (relieves me of making copies and having them with me at every class period). Handouts (relieves me of making lots of copies and having them with me at every class period). Announcements, such as a new date for completion of an assignment. I had several students join the class late . . . one joined just today. All I had to do was direct him to the site where all the assignments and material for the first exam are. That improves my standard of living.”

Question Two: Do you find that giving your students access to materials via CourseInfo has enhanced the learning experience?

- “Yes, but only if they learn to check it daily for new items.”
- “NO. IT IS VERY HELPFUL AND A VERY VALUABLE TOOL BUT IN MY USAGE OF COURSEINFO I AM NOT USING IT AS ANYTHING MORE THAN AN ADMINISTRATIVE TOOL.”
- “My personal feeling is that those who use CourseInfo are much more likely to have a passing grade. . . . Students become more involved in their learning experience. For example, rather than simply attending a lecture or reading the book, other information can be gained from materials on the site. Also, if they don’t take advantage of the group discussion possibilities, they learn from others that they would have benefited if they had gotten involved. I see this as an ‘accountability’ lesson.”
- “I would certainly hope so. I have not conducted any scientific evaluation, but students told me they have more complete notes through [using] CourseInfo.”
- “I’m teaching an MIS course, so I think it is very useful for my students to become more comfortable accessing information electronically and communicating electronically.”

- “Maybe, it does allow you to cover more material which frees up time for activities other than lecturing.”
- “Well . . . I’m not sure of that since I give the same number of assignments and the same number of handouts. One thing it does do: it forces the students to become at least minimally competent [in] using the Internet, and builds confidence for research for term papers, etc. That’s a secondary, but potentially important, effect.”

Question Three: What features would you like to see in CourseInfo that are not currently present?

- “I wish that there were a mechanism whereby my class list would automatically get an e-mail message from the system when I add something to CourseInfo. I am a dreamer, right? Or, am I just too lazy to e-mail them each time there is a change????”
- “I would like to be able to assign different weighting to quizzes and tests. I would like the fill-in-the-blank tests to be more flexible in accepting the format of the answer.”
- “It might be helpful for some of the more ‘technologically shy’ students if there were instructions for logging on/creating their user account at the start—maybe a noticeable icon?”
- “Ability to post answer keys with ease to both on-line and regular tests/quizzes.”
- “To be able to FTP files directly. To be able to load a quiz constructed off-line instead of having to type or paste each entry into a separate form field.”
- “Most importantly, it is necessary to assign different privileges to different users without the privileges being assigned to a particular title/class. A ‘Course Administrator’ class which would be able to assign/restrict all rights in varying combinations to different users.”

Question Four: Are there any specific deficiencies in CourseInfo which you feel need to be addressed?

- “Grade book needs to be like a true spreadsheet—and there needs to be a comma-delimited upload utility for it.”
- “Just a matter of simplicity: under course information or course documents, you have an item name (or title) and then a hot link simply saying ‘click here.’ Why couldn’t these be combined so that the item title is also the hot link?”
- “DEFINITELY do away with the ‘guest’ business to log in. It’s arcane, unfriendly and deters people outside UM to see what is happening here. I have to replicate the work of putting the syllabus and other public

docs on my personal website! A real pain! Need to remember to do two updates, etc. . . . VERY IMPRACTICAL.”

- “I had a large number of students (still have one or two) who had trouble getting access even after I had batch enrolled them—but most of the deficiencies are in the students themselves who are sometimes too lazy to check in.”
- “The new chat capability is terrible. The old one was better. Many students are losing their connections from outside of Ole Miss when taking quizzes. This has happened many times since the new version has been updated.
- “When quizzes are ‘made unavailable’ there should be an option to allow the scores to remain.”

Question Five: Have you found the minimum access to technology necessary to use CourseInfo (Internet Explorer 4.0/Netscape 4.0 or later) an impediment to your use of the software? Your students?

- “No.” “No.”
- “Thus far it has not been an extreme problem. It is possible that it could be in the future. Independent Study is not necessarily confined to the U.S., and reaches such a wide variety of students.”
- “I HAVE STUDENTS WITH PROBLEMS IF THEY DO NOT HAVE MICROSOFT WORD OR EXCEL, BUT THIS IS WHAT I USE SO I JUST SEND THEM TO A LAB THAT HAS IT.”
- “Oddly, they seem to be as challenged by telnet as they do the [Course-Info] page.
- “Yes it was a small problem when using the FTDC for teaching, on a couple of computers.”
- “Students complain that some docs uploaded sometimes are not viewable from their browsers, but it’s unclear where the incompatibility is coming from.”
- “Some, for example, those students without Office 2000 find it a little more difficult to download stuff or simply look through it. Dial-in users have even more difficulties downloading stuff through the phone line.”
- “No for me because my location in the university allows me access [to] it easily. Others, including students, have complained.”
- “Sometimes the students’ computers aren’t powerful enough.”
- “I find that some students resist it. I try to walk a fine line between abandoning the student to his/her fate, and forcing the student to get involved.”

STUDENT RESPONSE TO COURSEINFO

The student response to CourseInfo has been positive also. During the fall 1999 term, 47 students in MIS 280, "Business Application Programming," responded to a poll on CourseInfo in which they described their experiences using the software.

The first question asked the students to indicate their level of agreement or disagreement with the statement, "Having access to online materials through CourseInfo enhances my experience in this course." Figure 1 shows the responses to this question. Fewer than 10% of students responded to this statement with "Disagree" or "Strongly Disagree."

The second item asked students to rank CourseInfo features from most useful (1) to least useful (8). Table 3 shows the resulting rankings averaged for the entire class.

The third question asked students to name any features that they would like to see added to CourseInfo. Most students were satisfied with the current offering of features. Several students stated that they would like to see an alphabetical listing of the students who are enrolled in the class along with their e-mail addresses. This feature is currently included in CourseInfo, but given that several students were not aware of this after using the software for a full semester, it might be useful to add more navigation aids. At a mini-

FIGURE 1. Student Responses to Questionnaire.

Having access to on-line materials through CourseInfo enhances my experience in this course.

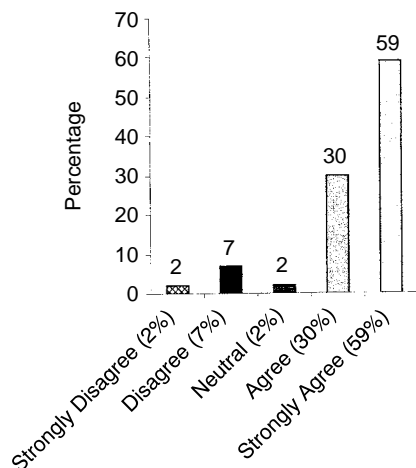


TABLE 3. Ranking of CourseInfo Features.

Feature	Ranking
On-line course materials	1
On-line assignments	2
Announcements	3
Grades lookup	4
On-line practice quizzes	5
Group e-mail	6
Document drop-box	7
Chat/message boards	8

mum, the instructor could emphasize this feature to the students early in the semester.

One student suggested that an MP3 trading room be added! Other suggestions were: a more general calendar of campus events in addition to the events related to the current course, more comprehensive statistics on how student grades fared in comparison with the rest of the class, more support for digitized video, better descriptions of the buttons on the left side of the initial screen, and a review section. One student suggested that a more direct logout method be added instead of having to close the Web browser at the end of each session. Another student suggested that a more direct method for getting to the course be added so visitors would not have to navigate through all of the college, department, and course listings. Again, this feature is available but not widely known.

The MIS 280 instructor posted most lecture notes as downloadable PowerPoint® presentations. Some student complained that they did not have access to PowerPoint. This could be remedied in future semesters by making a PowerPoint player available to the class. Generally, students liked having lecture materials posted because that allowed them to focus on the lecture rather than trying to capture all of the notes themselves.

The fourth item asked students whether using CourseInfo detracted from the learning experience in any way. All but one student stated that CourseInfo did not detract from the learning experience. The student who responded “yes” to this statement noted that a tool like CourseInfo could potentially make students become more lazy in that they might not have to attend class because they could get the notes on-line. This student also noted that using CourseInfo might reduce the face-to-face interaction that is an important part of the learning experience. Most students indicated that having access to on-line course materials helped them review for upcoming tests and also manage their schedules better.

The fifth item asked students whether they had adequate access to a computer and the campus network to use CourseInfo. Only 5% of the students responded that they did not have adequate access. It should be noted that the students who responded to this poll were mostly MIS majors in the School of Business where there are many interactive computer classrooms and state-of-the-art student computer labs.

FINAL THOUGHTS

Undertaking the implementation of the web-based course delivery system has been both a learning and growing process for all involved. We saw—and continue to see—an explosive increase in the number of instructors using this program at a far faster rate than we had anticipated at the outset. From a technical support perspective, this has meant having to stretch existing personnel resources to cover the increasing demand for support of CourseInfo: more course creation, more account administration, batch enrollment, general support. The instructional technology staff has seen an adjusted workload, primarily in training. Increased numbers of review sessions to assist faculty in whether or not to pursue CourseInfo and special training sessions for CourseInfo's specific features (on-line assessments, chat, grade book) are rapidly replacing requests for more complicated and technical HTML training.

The most significant impact, however, has been on the faculty and students using this tool. The faculty are finding that while CourseInfo is indeed a quicker and easier web-based mechanism to deliver materials to students, it still takes time and effort. It takes planning, the willingness to regularly update materials, the courage to leap across the technophobic gap of introducing current technology into the classroom environment, and a willingness to experiment with how an electronic medium changes the pedagogical process. Students are discovering that they *must* use a computer in these classroom environments. They, too, must overcome any personal technological terrors. They are discovering what it means to pursue electronic scholarship, using CourseInfo not just as a tool for information gathering, but for actually learning. As both faculty and students learn to navigate this educational environment, they continue to realize new ways of communicating with each other, sharing information, sharing the learning process, and surmounting the technical and pedagogical challenges facing them as they do so.

NOTE

1. The complete set of responses can be obtained by contacting <assist@olemiss.edu>.

REFERENCES

1. WebCT–World Wide Web Course Tools [resource on World Wide Web]. URL: <http://homebrew1.cs.ubc.ca/webct/>.
2. WBT Systems–The Leading Web Based Training Management Solution [resource on World Wide Web]. URL: <http://www.wbtsystems.com/>. Accessed 1999 Feb 25.
3. Blackboard: Creating Web-Based Platforms that Provide Online Course Delivery and Enterprise Systems for Colleges, Universities & Organizations [resource on World Wide Web]. URL: <http://www.blackboard.net/>. Accessed 1999 Feb 25.