Using courseware to deliver library instruction via the Web: four examples

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Keywords

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Abstract

Librarians at four academic institutions present their experiences using four courseware products (Web Course in a Box, Blackboard, eCollege.com, and WebCT) to teach information literacy skills. Objectives, methods, content, and student populations vary from place to place. In all four cases, with some reservations, librarians deem courseware a valuable tool for delivery of library instruction. They agree on the following primary advantages: support for interactivity; support for assessment/grade management; support for distance education; relatively quick development time; relatively low technical skill requirement; and raise the following concerns: inability to integrate quiz questions into the text of lessons; and diminution of interpersonal contact.

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Web-course-in-a-box at the University of California, Riverside (UCR)

Background and objectives

In 1997, a team at the University of California, Riverside developed an interactive Web-based tutorial to teach basic library and information literacy skills to freshman students. The tutorial was first employed in the fall of 1997 as one module of a four-part library instruction component of a first-year seminar course called Step-by-Step to College Success. The tutorial is now in its third major revision and is a required assignment in many English Composition classes.

Librarians have discovered some practical problems with these interactive tutorials. They require frequent revision to maintain currency, since the electronic learning environment changes rapidly. In the year after we developed the tutorial, our library has:

- changed from a telnet interface using dumb terminals to a Web interface using workstations;
- moved from relying solely upon the University of California's Melvyl union catalog to a local online public access catalog (OPAC); and
- attempted to keep up with periodical holdings displays. In addition to these challenges, incorporating interactivity into the tutorials required programming beyond the capabilities of our department, and a budget to pay programmers other than for minor changes. These considerations, as well as the resources necessary for beta testing the changes, are time-consuming. In short, a Web tutorial is not a quick fix.

In the summer of 1999, our instruction program was approached to participate once again in the Step-by-Step to College Success course. Our department lacked the human resources to meet the additional demands this course would place on our fall term instruction program. Our Web tutorial had been revised downward. It no longer included all the items we wanted to introduce to first-year students. Since the campus was already a subscriber to Web-Course-in-a Box (WCB) software, we

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thought it might solve some of our problems. It offered relatively quick development time, required low technical skills, and still supported the components of interactivity and student feedback.

Our goal was to use the WCB software as an adjunct technology to the library instruction program. We agreed with the course faculty that different modes of instruction would best address different student learning styles. Thus, the library course component would be a combination of classroom instruction and distance (online) education. We sought to use WCB to centralize and simplify access to our Web tutorial, the online public access catalog (OPAC), and a periodicals database, as well as to library-specific location information. The overall strategy was to cover the same content that we present to beginning college students in the classroom setting, but to arrange it into four manageable, logically sequenced lessons that students could access and complete independently.

Development

Initially, an hour-and-a-half meeting with one of several campus WCB administrators provided the training needed to begin the development of course content. At our institution, the campus WCB administrators also manage student enrollment, which is batch processed from the registrar's module on the campus network. Exceptions (e.g. audits) are handled by WCB administrators manually and promptly. They also manage usernames and passwords, so we did not have to learn these management functions.

On-campus support for WCB is excellent. The administrator is not only technically savvy, but understands the pedagogical issues involved in distance education. Response time for questions and problems is never more than one day, and usually just hours or minutes.

The functional areas in WCB present the instructor with a template composed of text boxes and radio button options. The instructor chooses options, inputs, or uploads text and/or graphics. It is easy to immediately display what the student interface will look like, as well as to modify it.

The WCB home page is arranged into six areas which can be customized by color, graphics, titles, and presence. The "Announcements" area is handy for adding up-to-the minute information and providing information to clarify student questions, although it is problematic that WCB adds new announcements in chronological order, so that students have to scroll to the bottom of the list to see new announcements. The "Class Info" area contains an introduction to the library component and states its goals and objectives. The "Students" section provides a roster of student names, their electronic mail addresses, and access to grades (passworded for a student's own data). The "Help/Utilities" section contains an online student guide to WCB, and an online instructors' guide, password access for students, and lists of sign-ins by student and by date. The "Schedule" section combines the functions of syllabus and course calendar. The course content is found in the "Learning Links" section. Different lessons can be created here using text/lecture, links to other Uniform Resource Locators (URLs), graphics, links to quizzes, and discussion forums. We chose to develop four lessons using different combinations of these features on each lesson.

Lesson one: planning research: develop and focus a topic (two parts)

One of the hardest tasks for students is to state a research problem clearly, and to understand the different forms of available information. This tutorial asked the students to:

(1) Use the MAGician Tutorial – this is a Web-based information literacy tutorial. It contains an introduction to formulating a search strategy, choosing a topic, the difference between magazines and journals, what a periodical index is, and how to read a Library of Congress call number.
(2) After completing the tutorial, the student is given the very general subject, "harassment" (all topics have been taken from students' course readings), and is asked to post a message on the class discussion forum.

The student must first state his/her more specific topic in the form of a question, then make a list of synonyms and related terms that describe that topic.

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Lesson two. The UCR Library Catalog – SCOTTY (two parts)

Students were asked to complete the following two assignments using the online public access catalog (OPAC) known as "SCOTTY":

(1) Search for a book using the OPAC (keyword search "cultural diversity").
(2) Complete a multiple choice quiz about using the OPAC.

Lesson three. Finding periodical articles using an electronic index (five parts)

One of the challenges most university students face is successfully locating a periodical article. These lessons asked the students to:

(1) Open the periodicals database (complicated by the remote access requirement of a separate database password).
(2) Perform a keyword search ("exercise and stress in college students").
(3) Read and decipher the search results.
(4) E-mail a citation to a librarian.
(5) E-mail a full-text article to yourself.

Lesson four: Finding information in the library (four parts)

The ability to navigate through a library to find needed information is critical to student success. These lessons instructed the students to:

(1) Link to the UCR Science Library's tutorial and complete only Section 4. This tutorial teaches students how to interpret periodicals holdings statements.
(2) Link to the "Where Are the Collections?" page of the library's Web site.
(3) Link to the floor maps.
(4) Complete a short cumulative quiz.

Implementation

We initially attended one of the course's lecture hall sessions and presented an overview of library resources and services to the entire class in a PowerPoint presentation. At this session we administered a pre-test of library skills. The following week we met with the students in their smaller discussion sections in the library's computer lab. During this session we introduced the students to WCB, making sure they understood the log-in procedure and how to navigate through the system. We distributed database passwords, and answered questions. Most importantly, we presented human faces to this online instruction experience. Students completed the four WCB lessons in four successive weeks. Finally, we attended their last lecture session making a brief appearance to administer a post-test of library skills and an evaluation of the library component of the course.

How did students adapt to this form of instruction? Only a handful of the students had used WCB – or any courseware product – before. Nevertheless, most students found it easy to use. The most-often encountered problems were caused by students not knowing their own campus computer lab passwords, or not reading the instructions within the lessons. Some students also had difficulty with opening a second browser window for ease in going back and forth from the lessons to the tutorial or the OPAC, or understanding that the appearance of a database can vary according to the computer platform used, Macintosh or PC.

Assessment

Assessment tools used were the pre- and post-test of library skills, the quizzes that were part of three of the lessons, and a student evaluation form (which was separate from the overall course evaluation form).

The pre-and post test scores were low. Moreover, the improvement in scores from pre- to post-test was disappointing: only about 5 percent improvement overall. Upon analysis we discovered why there was so little improvement. This course was a two-credit course offered not for a grade, but as pass/no-credit. When we asked course instructors why so few students were completing library assignments, they revealed to us that students could pass the course without doing any of the library assignments. Indeed, out of 161 students enrolled in the class, only 44 of them completed all of the library assignments, and 33 did not complete any. Yet, 159 took the pre-test and 127 took the post-test.

When we looked at data from the students who actually did the library assignments, results were more encouraging:

- A total of 111 students recorded scores for the MAGician tutorial. Their average quiz score was 80 percent.

- A total of 102 students recorded scores on the OPAC quiz. Their average score was 97 percent.

Course evaluations revealed that students found the WCB lessons useful by a margin of just over two to one. The session in the library computer lab was judged useful by a margin of three to one. These results seemed to validate our decision to employ a combination of instruction delivery modes and confirm our belief in the importance of personal interaction.

Lessons learned

Given the proliferation of distance education, as well as the relative stagnation of levels of instructional resources at most institutions, interactive courseware is likely to become an indispensable tool for instruction librarians. It is an imperfect system, as are most, but will surely improve as user needs drive the software market. As with any project, the learning curve with WCB included unexpected but ultimately beneficial bumps along the way.

Librarians did not achieve all of our objectives. WCB does not provide for a seamless interface between lessons and live Internet sessions for hands-on exercises. Moving between WCB and the OPAC, for instance, was clumsy at best. Yet, developing lessons using WCB forced us to organize and streamline even more than we typically did in preparing classroom instruction.

Students who would never speak aloud in a classroom setting sometimes blossom in an online environment. Using online discussion forums and electronic mail listservs allow them to participate in a new way. Still, for most learners, we regard the human interaction of the education process as too important to eliminate. Ideally then, courseware can best be used as a supplement to classroom instruction, rather than as a replacement for it.

Blackboard at Regent University

Introduction

Regent University is a graduate institution offering Master's and doctoral degrees through eight colleges. Of the current population of 2,155 students, 953 are classified as distance students. Regent University presently offers 120 courses online. A total of 15 degree programs, including the only LL M in International Taxation accredited by the American Bar Association, can be completed online. Since we are a graduate institution, many of our students are non-traditional, opting to work on degrees part-time after having established themselves in professions, or studying for career changes. As such, students exhibit a wide range of computer skills.

Prior to 1999, Regent University used Allari Forms and TopClass for online discussion forums. Both proved unsuitable because of problems with support and ease-of-use. A committee was appointed by the Dean of Distance Education to recommend courseware that would be used across the campus. The committee developed a list of criteria for selection which included the following components:

- student expectation of quality;
- simple, intuitive access for faculty and students;
- multilevel threaded discussion;
- text chat;
- password protected;
- file sharing in multiple formats, i.e. Powerpoint, RealMedia, Word, etc.;
- search or query discussions by author, date, or subject;
- integrated test/quiz feature;
- no client software required;
- able to save discussion lists; and
- match institutional infrastructure.

Additional desired features included a grade book, synchronous voice, and synchronous video capabilities. After reviewing 34 products, the committee chose Blackboard, which the University implemented in the fall of 1999. (Note: for a comparison of software, see http://www.regent.edu/distance/syllabus2000/collabhtml.html)

In the summer of 1999, the University Academic Council approved a proposal from the library to implement a required information literacy course to be completed by all students within their first year. The course is pass/fail. Since many of the students are returning to their education after many years, the main objectives of the library course are to

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re-introduce the research process to these students, and to familiarize them with the process for conducting research in an electronic environment.

The library course consists of five two-hour lessons. The course is taught both on campus and online. The course follows the basic steps of the research process and introduces students to library resources, focusing on full-text electronic databases. The University Library subscribes to over 100 databases, including *First Search, Lexis-Nexis Academic Universe, Dow Jones Interactive*, and *InfoTrac*. An optional subject specific module is available online. Since the fall of 1999, 500 students have completed the course. Of these, 177 were on-campus, and 323 online.

Development and implementation

Three areas of Blackboard contain the primary materials for the course content. Blackboard opens to the "Announcements" page, which provides students with current information. Announcements are posted at least once a week to provide tips for completion of the course and, more importantly, to develop rapport between the instructor and the distance education students. "Course Information" links to the course syllabus, and "Course Documents" hold the primary course content.

Folders are used for each of the five lessons and for the subject-specific modules. Lesson one outlines the basic research process, shows students how to build a search strategy, and introduces *CQ Researcher* as a source to find overview information on a research topic. Lesson two introduces students to the library catalog and to the *WorldCat* database. Lessons three and four focus on searching for articles in periodicals, and document delivery options. Lesson five covers guidelines for searching the Internet and for evaluating information. Students complete two worksheets; one on building a search strategy, and the other on developing a citation list. Accurate completion of the citation worksheet determines a "pass" for the course.

Course content

Course content is built through the instructor's control panel. Content can be organized into folders and sub-folders. Content can be typed directly into the text box, copied from a WORD or HTML document into the text box, or uploaded from an existing file. If content is added to the text box, it can later be modified directly from the box. Other options include displaying the file within the page or unzipping compressed files. Web links, PowerPoint, and other multimedia features can be incorporated when uploading files. Linking to offline content allows links to CD-ROMs. The instructor can control the availability of the lessons and can track the usage by lesson or by students.

Assessment Manager

The Assessment Manager is used to build quizzes, surveys, and other evaluation forms. Assessment can be built using various types of questions: multiple choice, true/false, fill in the blank, multiple answer, matching, ordering, and short answer/essay. We use the Assessment Manager to administer a competency test. Students who score 85 percent or higher automatically pass the course. The test has 40 questions, is timed for 45 minutes, and may be taken only once. During the first session in the fall, 14 students took the test and only two passed.

The Assessment Manager also offers the following options:

- "show detailed results" allows students to view the results of each of their answers rather than simply showing the final grade;
- "reveal correct answer" gives the correct response;
- "feedback enabled" allows the instructor to provide comments when the correct answer is given;
- "allow multiple attempts" allows students to take the quiz multiple times;
- "timed quiz" allows the instructor to set the time for the assessment;
- "password protected" allows the instructor to control the quiz by assigning a password.

Only those students with the password can take the quiz. Assessments can be saved to a pool, which can then be used to recycle entire quizzes, to reuse specific questions, or to randomly select questions.

Online grade book

The online grade book automatically posts the grades for all assignments. The instructor can

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manage the grade book, and can add grades for work completed outside the course. Grades can also be exported to a spreadsheet to facilitate calculations and course management activities.

Communication tools

For our course we use the e-mail and discussion board functions. The e-mail function allows individuals to send private e-mail to individuals or groups. When multiple sections of the course are taught (every semester we offer six sections on-campus, and two sections online), each section of students can discuss their specific problems and can share tips and other information as a group. Blackboard also features Virtual Classroom, Digital Dropbox, and File Exchange. Virtual Classroom can be used for synchronous lessons. The instructor can use the whiteboard to display a Web page or link to other information. Students and instructor can enter the discussion in real time. Digital Dropbox allows the student to submit files to the instructor. File Exchange allows the students to exchange files with each other.

Evaluation

We generally receive about a 50 percent response rate on our course evaluations, which ask students to rate whether the lessons are easy to read, how well the content is organized, and whether the Blackboard software is easy to use. Student evaluations of the course, and its implementation in Blackboard, have been positive from both the students who take the course on campus and those who take it online. Table I reflects student comments on the presentation of the material in Blackboard.

Instructors have also been pleased with the content of the course. Blackboard is easy to use. With a minimum of training, most instructors felt comfortable with inputting content and participating in communication. Our challenge for the future is to continue to modify the course. We are especially concerned with meeting the needs of the distance learners and have discussed initiating the virtual classroom feature. While the course requires considerable time to manage and maintain, librarians agree that it is well worth our time and effort to meet the needs of our students.

Table I Student comments on the presentation of the material in Blackboard

Content	On-campus students	Online students
Lessons easy to read	34% agree	53% strongly agree
Content well organized	46% agree	46% strongly agree
Blackboard was easy to use	46% agree	53% strongly agree

Real education/eCollege.com at Pace University

Introduction and objectives

Pace University's instruction program was approached late in 1998 to offer online library instruction to a class in its Literature and Communications Department, COM296L – Research Paper Process: Evaluating and Using Online Research. The class was an experimental one, which used the Real Education (now eCollege.com) delivery system.

Librarians had previously adapted Cornell University's *Hypertext Guide to Library Research* (http://www.library.cornell.edu/okuref/research/tutorial.html) in 1996/97, and thought that with minimal revision we could use the guide as a way to deliver the same instruction to distance students as we deliver to students in the library. Our general objectives for any library instruction we offer are to give students the tools and skills they need to complete their assignments. In addition, we strive to teach them that the research skills they learn now will be valuable to them in other courses, and after they have finished their formal education. In 1998 we began to change our sessions from a specific focus on a particular course or assignment to a more conceptual approach, related to the general components of the research process. Relaying the same message through an online course delivery system was one of the challenges we faced in the spring of 1999.

We decided that, instead of sending the students to separate library Web pages, we would integrate library instruction into the context of the overall course delivery system. Our goal here was twofold: first, that the students would already be familiar with the course interface and would not need additional instruction on how to use a separate tutorial; and second, we hoped that library instruction integrated into the course itself would be taken as seriously as the other course units.

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Development

With the system, the instructor does have the option of leaving the actual online development and uploading of course materials to the technicians at Real Education/eCollege (for a price). The current pricing structure for eCollege.com's services depends upon how much support the instructor wants. The professor for COM296L and I agreed to do the development of the course ourselves.

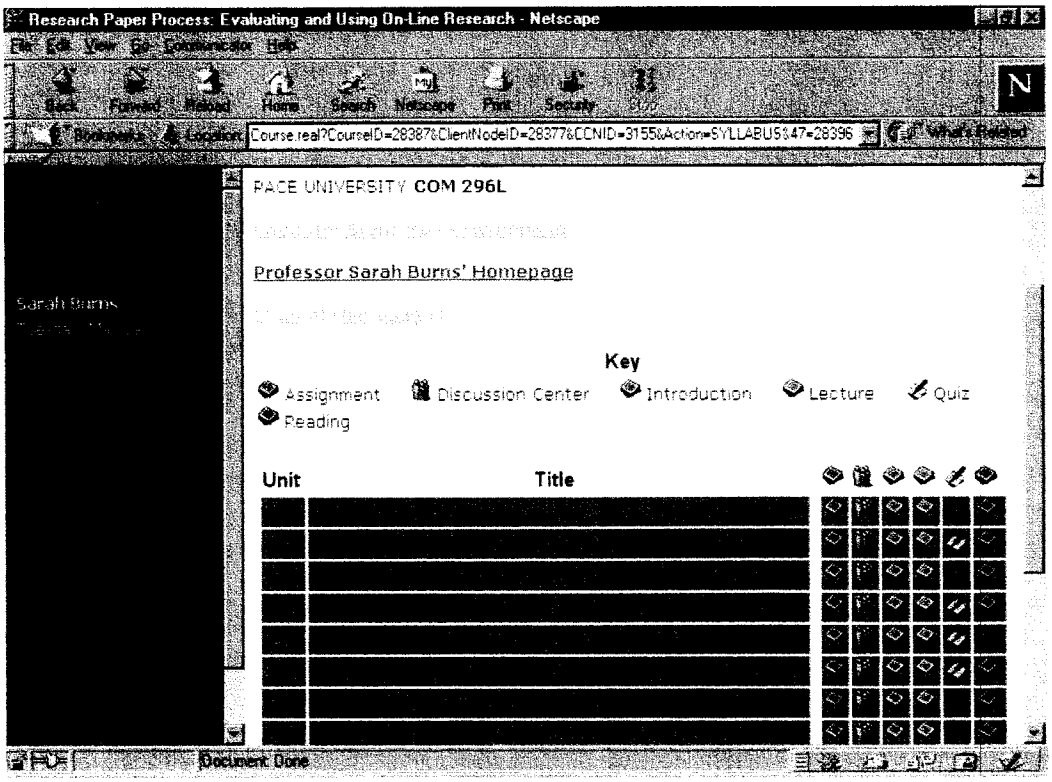
The Real Education/eCollege course screen (see Figure 1) is divided into two frames. The left-hand frame serves as a navigation tool, allowing the user to move between sections of the course and the system. The course content is displayed in the main frame. On log-in, the user is placed in the Interactive Syllabus, which displays all active course units, and graphic links to Learning Tools within those units. Learning Tools included are: Assignment, Discussion Center, Introduction, Lecture, Quiz and Reading. If a particular Learning Tool is part of a unit, an icon will be present. At the top of the Interactive Syllabus are links to the Professor's home page, and to the student homepages.

Instructor tools are located in the Course Manager. The learning curve for using it is manageable, but only if the instructor is already quite comfortable using some basic computer functions, such as copying and pasting, and uploading files. To make the most of the system, an instructor must have a working familiarity with coding HTML documents. Approximately 18 hours over three days were spent creating the bulk of the units and Learning Tools, plus an hour or two each day for the first two weeks of the semester doing further development and revision of content and the quizzes. One nice feature of the system is that both the instructors and the students can receive technical support from company personnel, with response time usually under 24 hours.

Using the Course Manager, I created several library units. Once these were completed, I started developing the Learning Tools.

For the first library unit, several Learning Tools were employed: Introduction, Lecture, Discussion Center, Assignment, Quiz, and Reading. The Introduction outlined the objectives for each unit. For example, by the

Figure 1 Real education/eCollege course screen



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and Web-Course-in-a-Box, in late April 1999 we selected WebCT.

Development

The existing tutorial was completely revised, partly to better meet the newly adopted information literacy competencies of the Wisconsin Association of Academic Librarians, and partly because of the need to integrate the structure of the tutorial with the WebCT delivery system. The tasks were to develop a new Web-based tutorial, to learn WebCT, and to develop both a question database and a series of quizzes that could be integrated into the tutorial.

After reviewing several tutorials, a decision was made to adapt the *Information Success* tutorial developed at the University of Wisconsin-LaCrosse. The authors of that tutorial, Stefan Smith and Nancy Steinhoff, agreed to allow us to adapt it to our institution and purposes.

The development stage was enhanced by looking at the tutorials developed by librarians at other "WebCT" libraries, such as the University of Central Florida, Purdue University, and Dalhousie University. This examination also educated us about the flexibility and inflexibility of the software product.

As we worked with WebCT, we learned about its features. We discovered that:

- It was not possible for students to redo only those questions that they missed. This meant that the standard of 100 percent correct answers was not possible. Therefore, we settled on 80 percent as the standard for passing a quiz.
- Quizzes could not be easily integrated into the tutorial, so they were, instead, placed at the end of each module.

On the other hand, we liked:

- The question database and the ability to categorize questions. We categorized them according to information literacy competencies.
- The ability to incorporate live searches into questions (not a built-in feature, but possible using Javascript to open a pop-up window).
- The variety of question types available – multiple-choice, true-false, matching, and short answer.
- The ability to give feedback for incorrect answers (both general feedback for the question as a whole, and feedback for a particular answer).
- The ability to develop student accounts in two ways: by uploading them from the campus student information system, which would work for students enrolled in the University Seminar course; and by allowing transfer students to create their own accounts.

Implementation

The two sections of University Seminar that beta-tested the tutorial provided useful feedback. Because instructors were in the lab with the students the entire time they were working on the tutorial, it was possible to observe and interact with the students. Everything worked; nothing crashed, and students seemed to actually enjoy the experience.

The fall semester, with its 39 sections of University Seminar plus 100 or so transfer students, would be a much more challenging test. The instructors would meet with each section once, and students would then complete the tutorial on their own.

We worked very hard to develop the sets of alternative questions that would allow us to randomize the quizzes. We hoped to have ten alternatives for each question, and we came close to that goal.

Initial results showed that students completed the tutorial and passed the requirement at about the same rate as students had during previous terms when the requirement was a tutorial/answer booklet combination. However, it was now taking students about an hour longer (four-five hours, rather than three-four hours), and the students were unhappy about the extra time requirement.

We also quickly realized that the live searches created a problem we had not anticipated. Any student who failed a quiz had to do all of the live searches over each time he/she retook it. Naturally, this was time-consuming and frustrating.

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Throughout the semester, we used WebCT's statistical reports to see which questions were being missed most often. Because these tools told us the incorrect answers that were being selected, they helped us to concentrate on where problems occurred.

We revised the whole tutorial for use in the spring semester. We completely revised both the quizzes and the tutorial. We reduced the number of live searches in the quizzes to a minimum, and incorporated self-test questions into the tutorial itself using *Dreamweaver* with its companion program, *Attain Objects* (now called *Coursebuilder*). The goal was to make the tutorial more interactive, and help prepare the students for the quizzes.

We tested the new version on the six sections of University Seminar taught in the spring. The results were much more positive from both the students' and the librarians' points of view. Faculty members also believed that students were more positive. The length of time students reported spending on the tutorial dropped to about three hours. We continued to monitor the quiz results using WebCT's statistical reports, and made changes throughout the semester.

Conclusion

Students seemed to have few problems with the WebCT framework and quiz system. WebCT offers a convenient way to achieve automated grading of quizzes and supports record keeping. We particularly liked these features of the WebCT software:

- online evaluation survey;
- statistical reports;
- question feedback;
- randomization of question sets;
- automated record keeping; and
- flexibility.

However, we wish we could:

- easily integrate the quiz questions within the body of the tutorial, making them seem more like required exercises than quizzes; and
- require students to redo only those questions that they missed, rather than an entire quiz.

Is it cost-effective? The nature of the information literacy requirement at our University means that we need a self-paced delivery method, and that means using something like a workbook or tutorial. These are, by their nature, time-consuming to develop, maintain and grade. By using WebCT, we have eliminated the grading/recordkeeping component. However, we have come to one interesting, if not painful, realization. Through the years, the staff time committed to this program has come from both librarians' and clerical support. As we have evolved from a workbook to a Web-based tutorial, the requirement of each type of staff time has shifted drastically. Moving content from paper to Web pages saves time and paper, but librarians rather than support staff now must do the labor. Librarians now create and maintain the question database that saves so much grading time previously spent by clerical staff.

Summary

In summary, when moving toward a courseware product for the delivery of library instruction, it is important to thoroughly investigate the current features available and assess the flexibility of the products to accommodate future needs. The experiences of these four librarians may help to guide local decisions.