Teaching from the Web: Constructing a Library Learning Environment Where Connections can be Made

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ABSTRACT

FACULTY LIBRARIANS AT CALIFORNIA STATE UNIVERSITY, Fullerton, collaborated with Management Science and Information Systems and Computer Science faculty to develop a new course, "Introduction to Information Technology and Presentation." This course has been taught to 125-150 freshmen each Fall for the last three years as part of the pioneering Fullerton First Year program. Several elements inherent in the process of designing and teaching this course have contributed to changes in the library's large formal instruction program. These include collaboration and feedback from team teaching, formal assessment and student evaluations and, above all, the increasing use of Web-based resources and state-of-the-art technology. This article will focus on the evolving nature of the instruction program, which is informed by the elements listed above as well as by ongoing experimentation with innovative, student-centered, active learning methods.

INTRODUCTION

California has a three-tiered system of public education, including the University of California system, the community college system, and the California State University system, which occupies the middle tier. The twenty-three California State schools enroll students from the top one-third of high school graduating classes and offer baccalaureate and master's degrees in both traditional liberal arts and applied fields.

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California State University, Fullerton (CSUF), is a large, diverse, commuter campus located in Orange County in southern California. The campus currently has an enrollment of 27,000 students. Over the next few years this enrollment will increase due to a tidal wave of more than 700,000 additional students expected to enter California public college and university campuses by 2010. According to the *Los Angeles Times* (1999), the new incoming students will be more ethnically diverse than in the past, with an increasing percentage comprised of Latinos. In addition to being an ethnically diverse campus, CSUF has a broad range of ages represented in the student body. Many students transfer in at the junior level from community colleges and many are more mature re-entry students. In fact, each year less than 10 percent of the entire student body is traditional 18-year-old first year students. CSUF is a commuter campus, with the inherent challenges of building a sense of community and maximizing retention rates, in contrast to the built-in campus connections more easily achieved in a traditional educational environment.

To give further coherence to the educational process, the university is currently in the process of defining "Marks of a Cal State Fullerton Graduate" (California State University, 1999). These marks attempt to succinctly describe the distinctive characteristics of a CSUF education. These characteristics include graduates who are experienced contributors on teams and in collaborative settings and who are skilled in using technology for research, analysis, and presentation. As a step toward actualizing these goals, the university president has made technology a priority for our campus. In 1997, an ambitious initiative was launched to fully network the campus. All faculty and staff received state-of-the-art computers with a common suite of programs and applications.

Overview of the Library Instruction Program

In July 1996, the Pollak Library opened a new library wing. The new building added 130,000 square feet, almost doubling the size of the facility. Seating space increased from 650 to more than 3,000. In keeping with the president's technology initiative, the building was outfitted with new computer workstations, docking stations, fiber-optic cabling, and four fully equipped library instruction rooms. The library is often a campus leader in the rollout of new equipment and programs and has the support of a large and responsive library computer systems section. These elements contributed to a growth and expansion of the library instruction program. Since 1996, the section has been on what Dupuis (1999) refers to as "a fast track of change that has challenged instruction librarians to continually develop new services and methods for teaching" (p. 288).

The Pollak Library has a very vigorous proactive instruction program that has been designated the number one priority for the library. The opening of the new building, with its state-of-the-art instruction rooms,

provided enhanced opportunities for innovation in library instruction and in what Gresham (1999) has termed "dynamic learning environments" (p. 28). Instead of one room with one portable projector, there are now four rooms with varied technological capabilities. Two rooms have student computer workstations that will accommodate twenty students or forty students working in pairs. These rooms have ceiling mounted projection units, and fully equipped instructor stations, with a computer console, an ELMO overhead projector, video capability, and a v-net control system that allows for alternative teaching techniques. The instructor can control all workstations, permit the students to have local control of their computers, or project any device to the overhead screen. Two additional rooms can accommodate larger classes. Each has a fully equipped instructor station, with the exception of the v-net system. One room has lecture seating for over 150 students. The other room has seventy-five tablet armchairs facing the screen and ten independent computer workstations around the perimeter. The room can be used in a lecture configuration or with up to five students, working in teams, at each station. The flexibility of this room offers instructors multiple choices in instruction techniques.

Building on the campus technology initiative and the enhanced facilities available because of the library expansion, the library instruction program has increased dramatically since 1995. Prior to the expansion, ten instruction librarians were teaching 125 faculty-requested sessions per semester. In Fall 1999, thirteen instruction librarians taught over 300 sessions in most disciplines and at all levels from remedial to master's level. In addition to these sessions, other learning opportunities include one-on-one research consultations, workshops, and the Fullerton First Year library component described below. The experience gained over the last three years has given instruction librarians at CSUF expertise in innovative student-centered, technology-based teaching.

Within the CSU system there has been a strong initiative to incorporate information competence into the curriculum. This is considered by librarians to be a critical skill for all students. Our current instruction program has evolved with this initiative in mind.

Fullerton First Year Program

Due to the CSUF campus demographics, there is an ongoing need for programs that will foster a stronger sense of community, improve the first year experience, give students the tools necessary for academic success, and increase student retention. The Fullerton First Year (FFY) program was designed to address these needs. With support from the university president, the program was planned as an academically integrated year-long experience with a service learning component that was open to all incoming first year students by application. In reading the applications, the selection committee looked for interest, motivation, and com-

mitment and selected a diverse cross-section of students. The initial cohort of 125 students was extensively profiled during this first year, 1997/98. According to Walker-Guyer (1999), results showed that these students would indeed benefit from such an integrated community-rich program. Most were 18 years old, over 65 percent were non-Caucasian, 75 percent were female, many commuted to campus, and 27 percent worked over 21 hours per week during the academic year.

The integrated nature of this program ties courses together with a central theme—"Education, Social Responsibility, and Community"—and encourages collaboration across disciplines. An initial call went out for campus faculty and student affairs professionals who would be interested in working collaboratively to shape this program. The FFY program was clearly addressing several of the "hot initiatives" mentioned by Ianuzzi (1998)—i.e., student retention, learning communities, and technology in the classroom (p. 99). Due to the library's strong commitment to information competency, the existing and very successful library instruction program, and the technological tools available, the library was in a good position to help this initiative succeed. Because of the collaborative nature of the project, a team of six librarians applied to the program. The FFY steering committee had not previously thought of including the library in the program, but realized the potential value of having a library component. The library's ongoing participation in the program, including the week-long FFY summer planning retreats, has built alliances with discipline faculty and student affairs professionals across campus and has increased library visibility.

The library team was paired with one faculty member from Computer Science (CPSC) and one faculty member from Management Science and Information Systems (MSIS). This group worked together to design a course that would include elements from each discipline—i.e., information competence, computer competence, and presentation skills. The new course, "Introduction to Information Technology and Presentation (IITP)" was designed as a two-unit class to be taught in one two-hour session each week during the fall semester. There were six sections of the course with approximately twenty-five students in each section. This course joined the roster of several other required courses planned for the FFY program and has been taught each Fall for the last three years.

MSIS and CPSC faculty taught computer competency, including computer basics such as Windows, e-mail, and Internet searching, and presentation skills, including PowerPoint and Web page creation. This component was taught in computer-equipped classrooms for eleven weeks. Library faculty team-taught electronic library resources, the distinction between popular and scholarly sources, interpreting and citing electronic resources, evaluating information on the Web, and electronically requesting books and articles. The six sections of this component were

taught by one or two librarians each for a four-week period in the library's state-of-the-art computer classrooms. The library team has worked collaboratively to create and modify the syllabus, in-class exercises, group activities, homework assignments, final exams, and Web materials. Student performance in the FFY library component was assessed using graded assignments and a final examination. These counted for 20 percent of the total IITP grade.

FFY and Library Instruction Evolution

The design and implementation of the FFY library component initially reflected experiences gained in the existing library instruction program. Both have changed dramatically during the past three years. In working collaboratively through issues of assessment, class structure and content, exercises, and assignments for the FFY library component, a more student-centered approach to instruction has evolved. Ideas generated and techniques used during each Fall's FFY library component were tested and refined during the following Spring's general library instruction sessions. The reciprocal lessons learned and changes made have greatly strengthened each. The most significant change has been the increased use by students and instructors of Web technology in all facets of the instruction program. Librarians have created both general and subject specific Web guides that augment general instruction. FFY library component course materials, including the syllabus, in-class exercises, assignments, and ultimately the final exam, were modified in the third year and posted on the Web using Blackboard CourseInfo software.

Assessment

The concept of assessment is central to the overall instruction program. A variety of assessment techniques are used to measure student learning and program effectiveness in order to determine what changes are desirable and to ascertain the effectiveness of changes. These techniques include both objective and subjective measurements such as class profiling, grading, and student and program evaluation. Increasingly, Web technology is being considered as the medium to assess student learning and acquisition of information competency.

In order to build a profile of FFY students, an assessment instrument was used to collect information on students' experience and confidence with technology and their attitudes toward technology. Data collected and shown in Figure 1 indicate that FFY students entering CSUF in 1998 were far more familiar with computer and Internet use than students entering in 1997. Although they are increasingly confident in their ability to effectively use these tools prior to taking the class (see Figure 2), performance on assignments and tests that measure student learning indicate that instruction in the area of information competency is still needed.

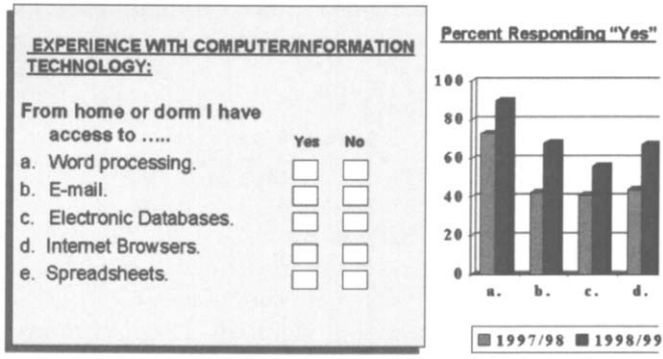

Figure 1. Profile of Entering FFY Freshmen in 1997/98 and 1998/99.

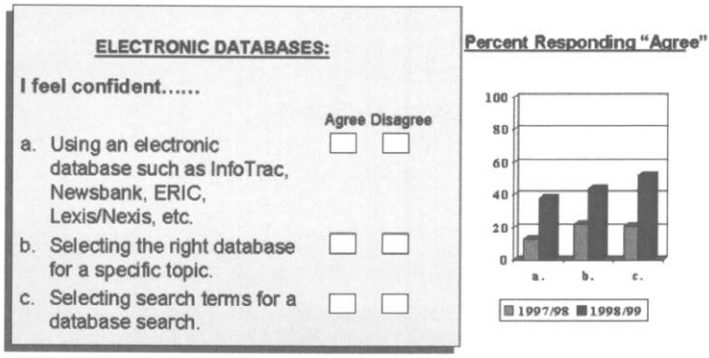

Figure 2. Confidence with Computer/Information Technology Prior to Class 1997/98 and 1998/99.

Content, Structure, and Delivery of Instruction Sessions

The decision to include the FFY library component within the IITP course influenced the choice of library component course content and the method of delivery. While the component was designed to provide students with a working knowledge of the library, whenever possible, students were introduced to Web-based, instead of more traditional paper-based, resources. A specialized Web guide was developed to create a well-defined and manageable set of introductory resources and explanatory materials. Experience teaching from this Web guide led to the modification of existing discipline-specific instruction Web guides, the creation of additional instruction Webs, and a more student-centered approach to teaching.

The FFY students came to the library in the tenth week of classes, after the computer component, with a good foundation in computer basics and general Internet use. The library component syllabus articulated specific learning goals for the four-week course module. Students would learn to identify principal library services and major collections as well as learn to access and use relevant library electronic resources. These included the library home page, the online public access catalog (OPAC), basic full-text background resources, full-text article and newspaper resources, and a discipline-specific citation database. Students would also be able to use and evaluate relevant World Wide Web sites, distinguish between popular and scholarly periodicals, interpret electronic bibliographic citations, and cite electronic materials. These learning goals have changed relatively little during the three-year period. The methods used to achieve them, however, have been modified significantly.

Library Home Page and OPAC. The library home page was used as a launch point to introduce students to library services, materials, and policies. Students were briefly shown how to locate floor maps, library navigation aids such as location codes, and general information such as library hours. This virtual tour was followed by a brief exploration of the OPAC. Students were then given a homework assignment designed to provide them with practice searching the OPAC and familiarity with one of five key areas of the library: reference, periodicals, audiovisual materials, curriculum materials center, and two floors of circulating books.

In this assignment, each student was asked to go to one of the five designated areas, explore the physical environment, and identify any existing service points such as help desks or reshelving areas. While in the area, they were required to pull an item randomly off the shelf, find the record in the OPAC, and print it. This gave them a better idea of the connection between the OPAC record, with its fields and controlled vocabulary, and the physical item and its location in the library. To ensure that they could read and interpret the bibliographic record, they were also asked to use the citation to find additional materials in the OPAC under the same subject heading. This engaged students in a more active way than a traditional library walking tour. The following week this homework assignment was followed by an in-class exercise in which students were grouped according to which of the five areas they had visited. Students were given time to discuss their findings and observations and answer several preselected prompts. Each group's recorder then reported to the class as a whole, giving everyone, including librarians, a more three dimensional picture than is possible using the online maps.

Both the homework assignment and the group exercise provided a student-based perspective of the library and the OPAC and highlighted unexpected challenges. Students were often unable to select required in-

formation from the formal bibliographic record and provide full information on titles and/or subject headings. Although much of the information needed for the assignment was available on the Web, such as location codes and floor maps, students often relied on more immediately accessible (and low tech) materials such as people at help desks and signs posted in elevators.

An assessment of the experience with Fullerton First Year students, and taking a cue from Dupuis' (1998) maxim "Call it what they'll understand and put it where they'll find it" has led to an evolution of the home page (p. 16). Twelve major links have been reduced to eight, providing more streamlined navigation. The language has been changed to reduce the amount of library jargon, making the page more easily understood by students. For example, "Indexes/Abstracts/Full-Text" changed initially to "Electronic Information Resources" and now reads "Find Articles and More." The "Introduction to Library Research" Web guide, originally created for FFY, has been modified and expanded, renamed, and given a prominent place on the home page.

An overview of the library given in most general library instruction sessions has also changed based on the Fullerton First Year experiences. Most sessions requested by faculty do not offer the luxury of eight hours of intensive library instruction. Introductory walking tours, as a result, have become briefer and are sometimes eliminated altogether unless they add significantly to the ability to complete a specific assignment. Instead, in-class hands-on exploration of the home page is used to address typical questions. Students who have previously experienced the sometimes frustrating process of finding library materials are often excited about and appreciate the ability to access floor maps and location codes.

Web Evaluation. During the first year of FFY, students were relatively inexperienced in general with using the Web to find information. A lecture/demonstration of useful sites was included to show them the potential of the Web for research purposes. During the second FFY year, a change was made. Due to the explosion of information on the Internet and its increased availability, and in response to some faculty concerns about the growing student use of inappropriate Web sites for assignments and papers, librarians sensitized students to the need for appraisal and together explored ways to evaluate sites on the Web. Many excellent Web evaluation resources exist. The library team surveyed these resources and chose the criteria established by Jim Kapoun in his "Seven Criteria for Evaluating Web Sites" (1998). These criteria were modified with the author's permission, retitled "Six Criteria for Evaluating Web Sites," used in a demonstration, applied by students in an assignment, and discussed during a group exercise.

The demonstration modeled for the students indicated how a team librarian evaluated and rated two contrasting Web sites on the use of alcohol

among teenagers using the seven criteria: authority, objectivity, accuracy, currency, content, relevancy, and aesthetics. For each of the criteria, evidence was provided from the sites to substantiate the evaluation. This was a preview for their homework assignment. For the homework, students received one of three versions of the assignment; each version listed a different URL for an informative site dealing with the issue of smoking. Students evaluated and rated the site using the seven criteria. The previous group exercise on the OPAC had been so successful that library team members created a similar exercise for this assignment, allowing students to interact informally, discuss their evaluations, and present the group's consensus rating of their site. Discussion was lively as students used different evidence to defend their rankings. As concluded by Sholz-Crane (1998), students need more than a simple checklist of criteria for evaluating Web sites, and the modeling of the assignment and subsequent group discussion provided this.

A review of final exam results by the library team showed that students had at least gained an awareness of the necessity to evaluate Web sites. In fact, the exam also indicated a strong student preference for library subscription databases that had been evaluated and selected for them. The "Six Criteria for Evaluating Web Sites" is accessible from the home page and now serves as the basis for most instruction involving Web evaluation. It has proven very popular with discipline faculty, who often request this learning module as part of the general library instruction session.

Online Full-Text Background Sources. The core classes that Fullerton First Year students take during the first year experience have varied over the three-year period. In addition to the IITP and University 100 courses, other required core courses have included basic English, political science, speech communication, ethnic studies, math, and science. In order to help students with assignments for written and oral presentations given in these courses, the library team decided to include instruction on two basic online full-text background resources: *Britannica Online* and *CQ Researcher.* Many students are familiar with encyclopedias and weekly publications and understand the structure and the concepts associated with them, such as authority and currency. In addition, both resources include citing examples, which makes it easy to introduce one of the IITP course learning objectives—the correct use of citations and style manuals. Students appreciated the ease of use and comprehensiveness of these resources, and immediately grasped the utility of both *Britannica Online* and *CQ Researcher* for completing assignments in their other introductory classes.

During the first year, both resources were demonstrated during a class session, and students were given homework assignments for each. There was no hands-on practice time allotted. Previous assumptions about student learning via lecture-style presentations were challenged. Students

were not able to apply immediately what had been demonstrated, and they found the lecture-demonstration boring and excessively long. Because they often did not begin to work on the homework assignment until almost a week after the demonstration, they had trouble navigating to and within both resources. They also had difficulty interpreting the assignments' sometimes ambiguous wording. In grading the homework, which had been considered relatively straightforward assignments, team librarians discovered these problems, but were unable to correct misconceptions in a timely manner.

To address some of these challenges, this learning module was modified to include more active learning. Demonstrations were kept to brief segments, followed by frequent practice searching and in-class exercises that modeled the upcoming homework assignment. The exercises were structured, with step-by-step instructions for navigating to the database, performing specific searches, and locating relevant information that would answer the exercise questions. This guided exploration activity, which highlighted the mechanical process rather than more conceptual thinking, assured the library team that students could follow instructions and effectively use the resources. Students were actively engaged, serious, and focused as they worked through the exercise. Librarians were able to observe navigating problems first hand, give useful browser tips like how to find words in a page, and immediately clarify any misconceptions. Difficulties in navigating and interpreting on-screen information can be discussed and resolved to the benefit of the entire class.

As is the case when utilizing Web technology, additional challenges were encountered. License agreements sometimes precluded extensive hands-on use because of limits to the number of simultaneous users. Moreover, too many users could sometimes slow the loading of information to the screen. To address these issues, several techniques were used: for example, having students work in groups of two or three, or having students volunteer or be selected to keyboard and project their work to the class. Additionally, due to the fluid nature of the Web, resources often changed without much advance notice. This necessitates designing or reviewing exercises and assignments as close to class time as possible.

Due to these experiences in FFY, our general library instruction sessions have changed dramatically. Most library instruction now includes hands-on practice, student keyboarding, formal in-class exercises, and group work, which reinforce course material and help students develop and apply information competence skills. This often means covering less in any one session but assures librarians that students learn what was explored more effectively, and that they enjoy the sessions more. Our experience corroborates the conclusion of Bren, Hilleman, and Topp (1998) that using a guided hands-on method increases student retention of information.

Full-Text Broad Periodical and Newspaper Indexes. To meet several other learning goals, students were next introduced to electronic full-text article and newspaper resources, including *Expanded Academic ASAP, Lexis/Nexis,* and *Proquest Direct.* These resources were used to illustrate concepts such as the distinction between popular and scholarly materials, the effective use of subject headings and journal indexes to conduct library research, and the interpretation and use of citations. Active learning techniques were expanded on a constructivist model.

These three resources were chosen because they are user friendly, have significant full-text content and broad subject coverage, and can be used to gather information for other FFY course assignments. In addition, *Expanded Academic* usually defaults to a subject search with the capability of narrowing by subdivision. Students conversant with using Internet subject directories such as Yahoo find the hierarchical approach of this database familiar, and librarians appreciate the ability to reinforce the utility of controlled vocabulary subject headings. *Expanded Academic* includes several publication types, and there is a limit function to restrict results to refereed publications. This provides an opportunity to discuss the distinction between popular and scholarly sources.

Students learned *Expanded Academic* quickly and appreciated the ability to focus their searches and e-mail complete articles. In grading assignments from the first two years, library team members noticed that students were still having difficulty distinguishing between popular and scholarly sources. They were unable to utilize elements in the citation and abstract to determine whether or not the item was likely to be from a scholarly source. Due to the electronic nature of the article, students saw it out of context and many of the clues normally utilized in this evaluative process, such as extensive advertising or author submission requirements, were missing.

To meet this challenge for the second year, a handout was modified and placed on the Web, which detailed the scholarly, versus popular, distinction. This was, however, too passive, and the students still had difficulty with the concept. Librarians endeavored to shift their role toward King's (1993) vision of "a facilitator who orchestrates the context, provides resources, and poses questions to stimulate students to think up their own answers" (p. 30). For the third year, a group exercise was created that would afford students the opportunity to physically handle and discuss different publication types. These included a newspaper, a popular weekly, a trade journal, and a scholarly journal. Each group was given a sample issue and asked to discuss what constituted the defining elements of the publication and report their findings to the class. They were asked the following questions:

- Who publishes or owns the periodical?

- Does the publication have ads? If so, what kind?
- What types of articles are published?
- Can you tell how the articles are selected?
- Do the articles have authors? If so, is any background information included?
- Are the articles long or short?
- What kind of illustrations or graphics do the articles have?
- Is there a bibliography at the end of any articles? If so, is it long or short?

In their group discussions, students came to understand and appreciate the different processes that go into creating these publications and the different audiences that they target. They gained skills that they could use to better interpret online citations and full-text material. As electronic journals evolve and proliferate, however, students new to the research process may have increasing difficulty evaluating the relevance of these online materials for their academic needs. As new models of publication are created, new techniques will need to be developed to ensure that students have the necessary tools to place these materials in an academic context.

In using *Expanded Academic,* students are also exposed for the first time to periodical citations without accompanying full-text. They need to correctly read and interpret the article citation to find successfully a copy of the article in the CSUF library. Predictably, this proved to be difficult. Although the students had used the OPAC for other purposes in a previous session, few of them thought to utilize it for this task. Moreover, it was problematic for them to know which term from the article citation to use for their OPAC search. Actually, they needed to start with the journal title. In addition, once the journal record was located in the OPAC, they had difficulty interpreting it to find the necessary issue availability and location information. Graded assignments revealed that, despite repeated in-class discussions on this, students often had problems.

During the past three years, teaching techniques for this critical series of steps have been altered for FFY sessions. To negotiate these steps, students are now taught to open two browser windows and switch between the OPAC and the article citation to obtain the information they need more efficiently. This also makes the distinction between the two resources more visually apparent. Brief and frequent hands-on modules are used to ensure that all students are more successful with the process. Finally, the library team has decided that the OPAC fits more naturally at this periodical citation stage of the process rather than in the customary first session. Students are naturally excited by full-text databases and, at this stage, more readily grasp the utility of the OPAC to augment and find additional materials.

Lexis/Nexis Academic Universe and *Proquest Direct* were selected as examples of online full-text newspaper resources. Students could use these to find information on current topical issues for many assignments in their other FFY courses. Also, because of the prior group activity in which they explored various publication types, students were familiar with the defining elements of a newspaper format. The varied ways to search these full-text resources provided both a challenge and an opportunity. Keyword searching of full-text information often results in too many hits and may also miss relevant articles. Library team members and students briefly utilized techniques to search within specific fields like headline and lead paragraph to make results more focused and precise. Brainstorming was used to find appropriate synonyms to broaden their results.

Many of these techniques have also been adapted for general library instruction, from fifty-minute introductory level to three-hour graduate level sessions. Abbreviated group discussions based on the popular/scholarly distinction exercise provide students with concrete representations of this sometimes abstract concept. A two-minute critical thinking exercise can often clarify the task of interpreting periodical citations and locating library materials. Discipline faculty attending the sessions are often surprised at the difficulty students at all levels have with this process. As more citation databases integrate library holdings and links to full-text journal articles, this difficulty will most likely be eliminated. Some library team members are introducing students to the OPAC at a more relevant stage—at the point when cited material must be found in the library.

Discipline-Specific Resources. To reflect the IITP course content, *Microcomputer Abstracts* (now called *Internet and Personal Computing Abstracts*) was selected by librarians as an example of a more typical discipline-specific periodical database. Due to their prior exposure to the citation and abstract format in *Expanded Academic*, students quickly grasped how to use this resource to locate technology-related articles and product reviews. This provided another opportunity to reinforce the use of the OPAC to locate materials in the CSUF library. In fact, in the third year, at the beginning of the final class session, students were given an exercise and asked to explore this resource independently without a brief introductory demonstration. The in-class discussion that followed the independent hands-on exercise focused on techniques that could be used to approach any new or recently changed electronic resource. For example, reading the introductory material that explains the scope and content of the database may be useful for determining its utility for a specific assignment. Also, all online resources have help screens that can explain various functions or search tips that can make searching more efficient and precise. Finally, use of limit functions or searching within specific fields can lead to more relevant results.

Librarians are experimenting with this in-class group exploration and subsequent student demonstration of databases that have not previously been discussed in class. Although the Web is a very dynamic medium, lecture demonstrations and step-by-step in-class exercises are typically controlled and linear. These student explorations have the advantage of presenting a variety of unscripted scenarios that may mirror far more realistic student information-seeking behavior. This unscripted exploration can provide a bridge for students to move from terms and techniques chosen by librarians to conducting their own research in unfamiliar databases. It also gives librarians insight into how students search and how well user interfaces work.

The Evolution of the Library Component Web and Other Library Research Webs

In the third year, library component materials, such as the syllabus, in-class exercises, homework assignments, component grades, and the final examination, were made available via a Blackboard CourseInfo Web site. From this site, students could also link to the "Introduction to Library Research" Web page, which had been created for the second year. This introductory Web included links to resources used in the class and explanatory materials such as the criteria for Web site evaluation and guidelines for distinguishing between popular and scholarly materials and citing sources.

This CourseInfo Web site provided several advantages to both students and librarians. The syllabus, with course objectives, course requirements, schedule, and contact information, was always available. Students could access the site twenty-four hours a day and, if absent, were required to retrieve necessary class materials. They could also check the status of their grades. Students could review concepts presented in class and refer to examples given. Library team members found it an advantage no longer to have to bring copies of the previous week's handouts, exercises, and assignments to class. They also felt that this site provided a more manageable library universe for these beginning students.

Because so much of the FFY library component is Web based, it was deemed a natural progression to experiment with migrating assessment instruments, such as the final exam, to the Web. In the third year, the library component final exam was given electronically. This had several benefits. Students were able to utilize and reinforce skills, such as interpretation of on-screen information, that had been practiced over the four weeks. In addition, students were given instant feedback on their exam results. Benefits to librarians included automatic grading and recording of exam results and the ability to analyze answers from individual questions in order to discover ambiguities or areas needing further explication. From this experience, additional Web-based instruments are being

developed to assess student learning during general library instruction sessions as well as electronic workshops.

Although students and library team members responded very favorably to the course component Web site, several potential disadvantages must be noted. The elimination of paper handouts and twenty-four hour reliance on electronic access and delivery makes the course vulnerable because server or online access problems can make information unavailable. The protected CourseInfo software requires students to register with user name and password, and although students were cautioned to remember or record this information, many did not. The necessity of posting library documents in both HTML and Word formats, to ensure wide access while preserving efficient formatting and printing, created additional work for the library team. With each new release of the software, considerable time and effort by the library team will be required to take advantage of new features. The site was successful in providing easy and convenient connections to all course-related resources and explanatory materials. However, the library team is concerned that small, extremely focused Webs, such as this one based on librarians' assumptions about student research needs, may be too restrictive and could inhibit student exploration of a wider array of useful resources. Also, multiple paths to a resource sometimes confuse students.

Despite these drawbacks, the library team and other instruction librarians continue to create and expand on Web-based library research guides for specific majors, specific classes, and special topics. The guides for majors contain pages that provide information on finding relevant books, articles, journal holdings, recommended and related Web sites, and annotated reference sources. Although each guide is organized in a standard format, information is tailored to the major, and the guide may include other relevant links and explanatory material. These guides are useful in several ways. Library instruction sessions often begin with an introduction to a specific major's guide, which provides an overview of discipline-appropriate resources. After the library session, students can refer to these guides when they are working on course-related assignments. The guides can be quickly modified and updated as resources change or new ones become available. The guides are prepared by a subject bibliographer and are useful to non-subject specialists who may do library instruction or provide reference assistance.

In working with students during FFY and library instruction sessions, librarians gain firsthand knowledge of how students navigate and use these Webs. From these observations, Webs have changed to become more student centered. For example, the Communications Web provides scanned images of the cover and sample pages from selected communications reference sources. This facilitates student recognition and use of these resources. Library jargon has been replaced with vocabulary that students

more readily understand. This will also make the sites more useful to any student doing research remotely. Faculty preparing Web sites for distance education courses would be well advised to field test their course Web to avoid constructing artificial roadblocks for their targeted users.

FFY Component and Library Instruction Evaluation

In order to monitor, evaluate, and improve the library component, feedback was sought from library team members and FFY students. During informal wrap-up discussions immediately following the second and third years of FFY, library team members reviewed the course objectives, individual sessions, and course materials.

Concerns were raised on the issue of standardization, including presentation of materials, attendance, and other classroom management policies, and grading of assignments and exams. Moving course materials, including the final exam, to the Web, has facilitated the standardization process. Team members found this "structured brainstorming" approach, as used by Keyser and Lucio (1998), to be very beneficial (p. 225).

Librarians also developed and administered an instrument in order to obtain direct student feedback on the library component. Evaluations were generally positive, although many students commented that they would have liked even less lecture and more hands-on practice with the Web. This reinforced the observation from graded assignments that students learned better when more actively engaged.

Lessons learned from FFY library component evaluations have also informed the general library instruction program. Prior to the session, library and discipline faculty often discuss and agree on common objectives. At the beginning of the class, these objectives are communicated to the students. The sessions often begin with some type of short informal assessment to determine such things as student expectations, experience with computers, and prior library use. With this knowledge, the librarian can modify the session to better meet the needs of the student.

An information competence pilot project was developed, and a Web-based instrument was created to assess student learning during selected library instruction sessions. Classes represented a cross-section of disciplines and grade levels. Data from this pilot program will be analyzed to determine if the library instruction program is meeting information competence objectives. The instrument will be modified for use in future library instruction sessions.

Workshops are offered throughout the semester to introduce students to the library and several basic electronic resources. Every participant now completes a short Web-based evaluation of the workshop. Feedback will be used to revise the workshop program to meet student needs more effectively. A more objective instrument to measure student learning is being developed for use in workshops and general library instruction sessions.

RECOMMENDATIONS

Librarians need to remain committed to the primary goal of academic library instruction—i.e., providing students with the tools necessary to use the library in order to succeed in college and beyond. But students are changing, technology continues to evolve, higher education is adapting to these changes, and librarians need to anticipate the effects of these changes and continually re-create library instruction:

- Because of the constantly changing Web environment, which requires continuous learning, librarians need to remain strong advocates for information competence.
- Whenever possible, librarians and faculty requesting library instruction sessions should synthesize library instruction, course, goals, and objectives for the session. This approach ensures that librarians can help provide the tools necessary for students to complete research assignments that meet discipline-specific learning goals.
- Although students will have differing levels of experience with technology, increasingly students will arrive in college equipped with basic computer skills. This allows librarians to spend more time on the research process, including evaluation and interpretation.
- As more campus labs are equipped with computers, and as Web-based library resources proliferate, librarians should consider providing instruction through these labs. The library can remain central to the educational experience while becoming more fully integrated with subject-based learning.
- Because students do not all have access to state-of-the-art equipment, care should be taken when creating interactive materials so that as many students as possible can take advantage of them.
- Because many students learn best by doing, online exercises should be structured to provide guidance, practice, and feedback. This also makes the learning experience available to distance students.
- Librarians should encourage students to make connections between resources and techniques learned during a specific library session and ways these can be applied to other assignments or other courses.
- Chat rooms or group Web sites can be added to class Web sites to substitute for, or augment, group activities.
- Assessment is fundamental in order to determine if goals are realistic and if they are being met by the instruction session. Distance education faculty should take advantage of Web-based instruments to profile their class and should also utilize synchronous or asynchronous methods to elicit student feedback.
- Assessment instruments should be administered online for ease of data collection.
- Librarians should lobby publishers to provide basic reference sources

online to facilitate ease of access any time, anywhere.

- Librarians should provide feedback on student perceptions and use and should lobby database publishers for changes that would promote standardization, such as truncation symbols and ease of use.

Conclusions

The library instruction program has benefitted in several ways from participation in FFY. Many connections have been made with discipline faculty and student affairs professionals that have provided opportunities to understand campus needs and to communicate that library faculty have the skills, knowledge, experience, and vision to help address these needs. Library faculty have worked collaboratively to design and implement effective library instruction techniques for FFY and have learned from each other, and been supported by each other, when proposing new ideas that can lead to enhanced student learning during these sessions. The responsibility of constructing goals and objectives and grading students in FFY has led to a growing appreciation of the role that assessment can play in determining the effect of all library instruction. Librarians who have participated in FFY over the last three years have worked with students increasingly familiar with the Web. To accommodate this familiarity and student information needs, most library instruction materials have been moved to the Web. The library component of FFY continues to function as a laboratory for new materials, better instruction techniques, and increased sharing of ideas among discipline and library faculty.

The convergence of a newly built library wing, campus administrators who had a vision of a technology enhanced environment, and faculty committed to connecting students to the campus and building community, have enhanced the experience for first year students. Library faculty, using technology and active learning, are creating an environment where students are encouraged to think for themselves and to construct a meaningful understanding of how the library and its resources can contribute to the success of their academic experience.

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