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## *Information Technology*

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### **Information Navigation 101**

#### **New programs teach undergraduates how to use the Internet and the online card catalog in search of the best sources**

By ANDREA L. FOSTER

Fullerton, Calif.

College students use technology constantly. They text-message friends, compile playlists for their iPods, and are whizzes at updating their MySpace profiles. But when it comes to one kind of work they are required to do in college — namely, academic research — they can be inept. Too often, college officials say, students rely on Google or Wikipedia as sources, as if oblivious to peer-reviewed scholarship.

The Net Generation, it turns out, may not be so tech savvy after all.

The explosion of electronic information is fueling students' confusion, librarians say. In 1996 there were 10,000 scholarly databases online; now they exceed 18,000. The Web is teeming with more than 100 million sites, up from 18,000 in 1995. Google and Microsoft recently began archiving books and scholarly journals and making them available via their search engines. And two online, academic-oriented encyclopedias, Citizendium and Scholarpedia, are starting up, inspired by the success of Wikipedia, the open-source encyclopedia that anyone can edit. Students are drowning in information.

"When I was a college student, there was only one place to get information, and that was in the college library, where the materials had been viewed by librarians, been reviewed by professors, experts in the field, so you knew you had authoritative information," said Lorie Roth, assistant vice chancellor for academic programs at the California State University system, who earned a doctorate in English in 1983. "Now you've got choices all over the place, with no definite status of authority and integrity."

To encourage students to use scholarly material, professors here at Cal State's Fullerton campus often send their students to a computer lab, where a librarian shows them how to navigate the university's online catalog of databases, scholarly books, and journals to do research in a particular discipline. Many journal articles can be viewed in full online, and material that the library does not have can be borrowed from another library with the click of a mouse, students are told.

That kind of instruction is occurring at colleges all over the country as part of "information literacy," a growing librarian-led movement to make students more adept at locating and evaluating electronic data.

Accrediting agencies are now considering information-literacy programs as measures of an institution's performance. Colleges are forming mission statements around the issue and hiring librarians to teach it, academic conferences have been convened on the topic, and the Educational Testing Service is

promoting its standardized test for high-school and college students to measure information-literacy skills.

Educause, a higher-education technology consortium, released three white papers on the topic this past fall. Unesco published a 115-page handbook last year to promote information literacy worldwide. In November the National Forum on Information Literacy created a group of 16 educators and business leaders to set national standards for information literacy, and the first issue of a scholarly journal on such literacy is coming out in May.

"All of us are now going to the Internet because it's convenient," said Diana G. Oblinger, a vice president of Educause. "Whether this is the world we wanted or not, this is the world that we live in, and it's important to help people develop research skills to be effective."

### **A Long History**

Cal State was among the first universities nationwide to embrace information literacy. It is now in its 12th year of a program that encourages faculty members and librarians at the university's 23 campuses to collaborate to teach students how to find, sort, analyze, and communicate information.

The term has been bandied about since at least 1974 when Paul Zurkowski, former president of the now-defunct Information Industry Association, urged a federal agency to create a program to bolster people's ability to use information for work. He called such people "information literates."

But many trace the ascendance of information literacy in academe to 1989 when the American Library Association called it a necessary skill and urged schools and colleges to integrate it into their curricula. Also that year, Patricia Senn Breivik and E. Gordon Gee came out with *Information Literacy: Revolution in the Library* (American Council on Education, Macmillan).

The book encouraged librarians to take the lead in helping students develop skills to find and evaluate information. Ms. Breivik, a retired college librarian, and Mr. Gee, now chancellor of Vanderbilt University, argued that an "information explosion" was fueling a crisis in the ability of people to solve problems and make decisions — and that was 18 years ago, before the rudimentary search engine Gopher was around, much less Google.

Many colleges have since interpreted information-literacy instruction to mean anything connected to research, including how to avoid plagiarizing, respect copyrights, and understand footnotes.

Information-literacy instruction at the Fullerton campus — about 45 miles southeast of Los Angeles — includes these elements but strongly encourages students to take advantage of the library's online resources and to skeptically view data from Web sites and other popular media sources.

Like many colleges, Fullerton uses as its guide the definition of information literacy offered by the Association of College & Research Libraries in January 2000, which says a proliferation of information is overwhelming people and that they need help to determine what is relevant.

Educause prefers the term "Net savvy" to convey the idea that students need to be sophisticated users of software and understand, for example, how search engines rank their results and how social-networking sites can undermine privacy, said Ms. Oblinger.

Urban campuses and those with a racially diverse student body, like California State University's, tend

to be particularly active in promoting information literacy because students there focus more on honing skills that will appeal to employers. At Fullerton, largely a commuter campus, since the fall of 2004 about 31 percent of incoming freshmen have been Hispanic and 12 percent are Asian. Most of these students are the first in their families to attend college.

At the University of North Texas, where 37 percent of the freshmen are minority students, the library recently raised the number of computer workstations from 26 to 52 to make more room for information-literacy instruction. "Students think they know more than they do," said Frances A. May, the library's coordinator of user education and outreach.

The Association of College & Research Libraries surveyed academic libraries in 1994 and 1995 and found that 22 percent ran some kind of information-literacy program. Now nearly every college library has a staff member charged with integrating information literacy into the curriculum, said Mary Jane Petrowski, associate director of the library group. "It's just so pervasive," she said.

Some campuses even require students to prove their competence in the area. At Cal State's San Francisco campus students must demonstrate "information competency" by meeting any one of three requirements before graduating: taking an online tutorial in research skills, getting at least a C- in a library course, or holding a library degree.

### **Cult Following**

Few question that students need help evaluating information. But some librarians criticize colleges for how they have interpreted information literacy or for what they say is the cultish zeal of the movement's advocates.

"Some of my librarian colleagues get into this missionary thing like this is really important and it's really new," said Barbara Fister, academic librarian at Gustavus Adolphus College in Saint Peter, Minn. "Well, I think it's very important, but I don't think it's new. And the faculty haven't used this phrase, but they've been doing it for a long time."

She says that the information-literacy standards articulated by the research library group, which prescribe six skills that students need to master, seem to ignore the creativity and originality that can go into communicating information. People treat the standards "like the criminal code," she said.

Others, like Stanley Wilder, associate dean of the River Campus libraries at the University of Rochester, criticize their colleagues for treating information literacy as if it should be a separate academic discipline.

"It's kind of a path to irrelevancy because information seeking is going to become simpler," he said. "It's becoming simpler every day." Knowing how to use Boolean qualifiers to narrow search requests, for example, is an almost obsolete skill, yet some colleges still make it part of their information-literacy instruction, he said.

But at the Fullerton campus faculty members have been receptive to information literacy; they are frustrated by students' overreliance on Google and Yahoo to complete research assignments, said Suellen Cox, head of instruction and information services for the library. They complain that students are often unable to distinguish infomercials on Web sites from facts.

At the request of faculty members, university librarians now lead about 300 information-literacy

sessions for students each semester, said Ms. Cox. Freshmen also receive such instruction.

Irene Lange, a professor and chairman of the marketing department at Fullerton, requested two sessions for her class last month. For the first session she asked her students to answer questions about international trade and currency, while Robert Sage, a Fullerton librarian, introduced them to three online databases: the Global Market Information Database, USA Trade Online, and Europa World Plus, all available through the library's Web portal.

He impressed on students the reliability of the information since, he said, the databases use information from, respectively, the International Monetary Fund, the U.S. Census Bureau, and the United Nations.

Ms. Lange sat in the back of the room, and periodically walked around the computer lab to answer students' questions. The librarians ask professors to attend the sessions because they, too, may benefit.

### **Measuring Students**

Since colleges and accrediting agencies say college graduates must be information literate, a slew of standardized tests now purport to measure students' skills in this area.

Among the most well known is the ICT Literacy Assessment, which was developed and is administered by the Educational Testing Service, a nonprofit group based in Princeton, N.J. "ICT" stands for "information and communication technology." The 75-minute test, offered at two levels, measures students' ability in seven areas, including organizing, evaluating, and communicating with electronic data.

ETS gave an early version of the test in 2006 to 5,338 college students and 1,012 high-school students across the country — including 924 from six Cal State campuses — and concluded that many students were unprepared for college-level work. Forty-eight percent of test takers could not identify the objectivity of a Web site, the testing group said.

Ms. Roth, an advocate for information literacy at Cal State, says a majority of the system's 23 campuses are giving the test to freshmen. The university system, along with a several other colleges, helped ETS design the test. She anticipates that campuses will use the examination to track the progress of its students, perhaps testing juniors who took the test as freshmen.

She praises the test, saying it presents students with the same type of problems they would encounter in college and in the work force, and does so without resorting to multiple-choice or fill-in-the-blank questions. "After 10 years of work here in Cal State, we were never able to develop something as sophisticated and as engaging," she said.

Several colleges have developed their own tests to measure students' information-literacy skills. At Cal State's Sacramento campus a librarian has created a multiple-choice online examination that all students in the university's general-education program take. Students who fail to score at least 80 percent are required to take a six-part tutorial. Then they take a similar test that measures their understanding of concepts as wide-ranging as Boolean searching, plagiarism, and the reliability of Web information.

Kent State University has led the development of another popular test, the Standardized Assessment of Information Literacy Skills. About 80 colleges have given the 35-minute, multiple-choice test to their students, whose answers have helped to refine it. It costs colleges about \$3 per student to offer the test, while the ETS test costs \$25.

Most librarians said they viewed the tests as only one measure of students' information-literacy proficiency. Some anticipated that colleges would move away from standardized tests in favor of interpretive measures of students' skills, like research papers, multimedia projects, and electronic portfolios.

"We're thinking our students will not be taking objective tests. They will be producing products, artifacts, videos, shows, pieces of art," said Charles Dziuban, director of the research initiative for teaching effectiveness at the University of Central Florida. The institution is about 18 months into a five-year, \$4-million information-literacy program that it hopes will impress regional accreditation officials.

Richard C. Pollard, university librarian at Fullerton, said he thinks the ETS test is a good measurement of students' skills. But occasionally he wonders whether it is the faculty members who need testing.

Some professors assume that all electronic information is suspect, said Mr. Pollard. He recalled how a student once approached the library's reference desk and asked for help with a research paper. His professor told him to use three sources, all of which had to be from sources printed on paper.

#### **TESTING A NEW KIND OF LITERACY**

The educational Testing Services is promoting its test to measure how well students' use technology to find, organize, and communicate information. This advanced-level question from an online demonstration is designed to measure students' ability to access data.

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