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Integrating Information Literacy into the Academic Curriculum

Wendell Barbour, California State University, Bakersfield

Christy Gavin, California State University, Bakersfield

Joan Canfield, California State University, Bakersfield



Overview

Technology has given educators and librarians outstanding tools to draw upon in their efforts to instruct learners who depend on and live in an electronic world. Academic libraries spend millions of dollars on the purchase and support of research databases and other technology resources. Higher education's expansive investment in information technology (IT) clearly demonstrates its vital role in the curriculum.

Now we must ask, has that investment been fully realized? Higher education has built impressive technological infrastructures, yet educators and policymakers have been slow to realize that to maximize technology, students and faculty must be skilled in their use.

Without a concentrated effort on the part of technology specialists, faculty, librarians, and administrators, the job of integrating information literacy and technology into the academic curriculum in a meaningful way will be a struggle. This research bulletin is intended to inform all parties of the integral part that each must play in order to facilitate change in this arena.

Proficiency entails knowing the mechanics of computer use as well as applying advanced cognitive skills in retrieving, evaluating, and communicating information. It also involves basic computer competencies such as learning how to use e-mail, operating systems, word processors, graphics programs, and spreadsheets. Cognitive skills (information competencies) engage students in higher-level thinking and problem-solving skills so that they can locate and retrieve information; determine relevant information; develop strong search strategies; and critically evaluate, manage, and communicate information.

While computer competency and information competency are interdependent skills, information literacy has broader implications. The National Academy of Science's National Research Council concludes that "being fluent" in information technology entails going beyond being literate with hardware and software to "...the ability to reformulate knowledge, to express oneself creatively and appropriately, and to produce and generate information (rather than simply to comprehend it)."¹

Thus, the information-literate individual focuses on content: exploring, evaluating, and converting facts and data into new knowledge that can be communicated in a meaningful way. Having the latest technological bells and whistles is admirable but insufficient if students and faculty remain uninformed about how to use them.

Until recently, instruction focused on the operation of technology tools rather than on teaching students how to fully exploit the capabilities of technology products. This focus stems from academics' assumption that, when trained in computer basics, students are then competent enough to make the most of these technological tools. Training in computer basics may prepare students to communicate via e-mail, create PowerPoint presentations, and navigate the Web, but technical training alone fails to teach them how to frame research questions, search for and determine relevant data, and critique

the authority of the retrieved sources. The following scenario illustrates the consequences of overlooking the importance of information skills.

For her sociology course, Suzy Smith's assignment is to use PowerPoint to summarize her research paper on the death penalty. Because Suzy knows how to use PowerPoint, she is able to create an attractive presentation, with pretty colors and provocative graphics. Yet, because she is untrained in information competencies, her content—the information being communicated—is superficial, lacking in authority, and illogically organized. Hence, she presents an attractive but meaningless product.

For students like Suzy, information literacy programs reduce their insecurity and increase their sense of control over the staggering amount of information that is disseminated daily. Consider that in the early days of scholarship, a researcher could easily find and absorb the bulk of information published on William Shakespeare. Today, electronic library databases such as MLA International Bibliography, JSTOR, WilsonWeb, and Humanities Abstracts each year churn out approximately 900 citations to books and articles examining Shakespeare's plays. Students researching a topic such as this with little or no training in research strategies and other information competencies quickly become overwhelmed with the amount of material they can retrieve. Frustrated, students randomly and indiscriminately choose items based on catchy titles or on the first few items that pop up in the results list.

Gradually, higher education has begun supporting information literacy programs. This change is due in large part to two forces. First, the information literacy movement is gaining momentum. Academe realizes that it must offer students systematic instruction in how to grapple with the glut of information—to teach them to know what is out there, understand how to search for specific data, and determine what is credible. Second, librarians and faculty are beginning to collaborate with IT specialists in an effort to create learning environments that make it possible for students to apply information literacy skills to the technological tools that are made available to them.

Collaboration among faculty, librarians, and technical staff is essential in order to outline the appropriate training needs, information sources, learning modules, and computer and information literacy requirements, as well as to help students gain expertise in technical design and interface issues that will help them succeed in a university environment and beyond. The Internet is rich with information about countless alternatives for knowledge gathering. Information literacy skills will enable students and faculty to better organize the wealth of information that they must keep track of, encourage self-direction, and improve learning processes.

Highlights of Integrating Information Literacy into the Academic Curriculum

Historically, academia has emphasized the IT machinery, which, as Ayers and Grisham asserted, has “created a doughnut IT infrastructure: all periphery and no center.”² While higher education has provided funding for ubiquitous computing and invested heavily in computer applications and electronic library resources, it has been slow to teach end users how to use these technological tools effectively. Increasingly, educators are realizing that the learning environment must be restructured so that it makes full use of technological innovations as well as meets the objectives of information literacy, computer literacy, and lifelong learning in students’ chosen fields of study.



Information literacy programs should provide students with systematic instruction beginning in their freshman year and continuing until they graduate. In addition to receiving formal instruction in information literacy, students should be able to reinforce and build on those skills across their course of study. Information competencies cannot be learned in a vacuum; they must be used often and within a variety of curricular contexts.

Nationwide Initiatives

Librarians have been on the cutting edge of the information literacy movement for many years. During the late 1980s and early 1990s, while campuses were starting to connect to the digital world, academic librarians were forming the concept of information literacy. The model emerged from the objectives of bibliographic instruction, a curriculum taught by librarians for many years. In 1989, Breivik asserted in *Information Literacy: Revolution in the Library* that information competencies should be considered critical to lifelong learning.³ By the end of the 1990s, the Association of College and Research Libraries (ACRL) had further developed the concept of information literacy by creating a set of competency standards and outcomes that have been widely cited and adapted by educators, accrediting agencies, and policymakers across the United States.⁴

The instructional model used for information literacy rejects the traditional teacher-centered learning model where the teacher imparts information to students who dutifully record it in their notebooks. Rather, information literacy is based on the active learning model in which the student is at the center of the learning environment. This paradigm is clearly seen in the competency standards and outcomes that have been developed by

ACRL.⁵ This ACRL document articulates particular goals, objectives, and outcomes for specific information competencies. Unfortunately, the majority of students' research strategies do not meet these standards.

The California State University Initiatives

The California State University (CSU) system tackled the concept of information literacy early. In 1994, the CSU library directors identified information competency as a key priority and recommended that the CSU "establish basic competence levels in the use of recorded knowledge and information and processes for assessment of student competence."⁶ To fulfill the first part of these recommendations, the Office of Academic Affairs formed the CSU Information Competence Work Group to address the question, what is information competence? The work group defined information competence as "the integration of library literacy, computer literacy, media literacy, technological literacy, ethics, critical thinking, and communication skills."⁷

This definition was then articulated into a set of information competencies. To find, evaluate, use, communicate, and appreciate information in all its various formats, students must be able to

- formulate and state research questions, problems, or issues;
- determine the information requirements for a research question, problem, or issue in order to formulate a search strategy that will use a variety of resources;
- locate and retrieve relevant information using Boolean and other high-level search strategies;
- organize information in a manner that permits analysis, evaluation, synthesis, and understanding;
- create and communicate information effectively using various media;
- understand the ethical, legal, and sociopolitical issues surrounding information; and
- understand the techniques, points of view, and practices employed in the presentation of information from all sources.

This set of competencies has served as a guiding principle for faculty and librarians who have had competitive grant proposals funded by the CSU. Recent projects include:

- Furthering the Information Competence of the 21st-Century Agribusiness Manager (CSU San Luis Obispo)
- Information Literacy and Black Studies (CSU Long Beach)
- Promoting Information Competence in Nursing Students (CSU Chico)
- Chicano and Latino Studies Information Literacy Competence (CSU Sonoma State University)

- Incorporating Information Competence into the Geography Curriculum (Humboldt State University)
- Information Competence for Students in Sociology (joint proposal from CSU Bakersfield and CSU Fresno)

The CSU also recognizes the importance of teaching the teachers. To increase faculty understanding and involvement in information literacy, the CSU has funded development workshops that cover strategies on how to incorporate competencies into the curriculum and to test and assess the learning outcomes of those standards.

To fulfill the work group's second recommendation that relates to measuring student outcomes in information competencies, the CSU Information Competence Assessment Task Force was formed. This task force focused on the assessment of information competence and the incorporation of competence standards into the learning outcomes of the academic departments. The task force contracted with the Social and Behavioral Research Institute at CSU San Marcos to assess the information competence of CSU students. The purpose of the five-year project, which consists of three phases, is to gather data on how students use information in their daily lives—how they find, evaluate, organize, and communicate data.

The first two of the project's three phases concluded that students

- find very little appropriate information using the Web;
- could find relevant material and spend less time searching if they use Boolean and other effective database searching skills;
- give up easily when using library databases and catalogs; and
- use library databases and catalogs ineffectively.⁸

The project's conclusions reaffirmed what librarians have known for some time—it is imperative that libraries serve as learning environments to support student instruction in information literacy, in addition to being a repository for information sources.

The hope is that the findings of this project will persuade practitioners and administrators to invest more in library-related information literacy projects.

Higher Education Information and Communication Technology Assessment Initiative

The higher education Information and Communication Technology (ICT) assessment initiative addresses the gap between technology proficiency and information literacy by developing testing to access how well universities are incorporating information and communication literacy into their curricula. Working with the Educational Testing Service (ETS), the CSU and six other universities are focusing on developing tools to measure ICT in higher education. The tools will measure the cognitive and problem-solving skills of students in the use of digital technology in a knowledge-based society. They will focus on cognitive skills necessary to access, manage, integrate, evaluate, and create

information in order to function efficiently. ETS measures how content is applied in problem-solving and reasoning exercises. The ICT panel anticipates that its efforts will lead to the development of assessments that will present data used to create more effective policies to address information and computer literacy.

California State University, Bakersfield, Initiatives

The CSUB library has had a dynamic information literacy program for many years. The library has offered an array of courses in teaching students how to make sense out of the bewildering array of research sources available to them. These courses include:

- Writing and Researching the Term Paper
- Researching the Electronic Library
- Researching the Internet

Librarians and faculty have recognized that students learn competency skills best when the skills relate to a specific course. In response, the library and several departments have been collaborating on creating discipline-based information literacy courses:

- Library Research Skills Lab (required component of the English department's freshman composition course)
- English Scholarly Research Methods (required course for graduate students in English)
- Electronic Legal Research Methods (required course for majors in environment resource management)
- Information Competency and California Technology Assistance Project (CTAP) Level I (required course for liberal studies majors)

In 2005, these courses will form the nucleus of CSUB's information literacy requirement. In the late 1990s, in response to the CSU mandate that information literacy become an integral part of curriculum at CSU campuses, CSUB organized the Information Competency Committee. The faculty, librarians, and administrators on this committee developed mechanisms for implementing information competency standards and for assessing student achievement of the competencies. The committee agreed that before it could develop satisfactory methods of implementation and assessment, it needed to articulate the specific aptitudes that clarify what information competency is and how it differs from computer basics. Each set of competencies was divided into basic, intermediate, and advanced skills.

For example, at the basic skill level, a computer-literate student should be able to master machine basics, keyboarding, using e-mail, and so forth. Basic skills expected for information literacy students include developing research questions, identifying basic research tools, retrieving books and articles from online databases, differentiating between popular and scholarly research sources, and evaluating the credibility of sources. Moreover, an information-literate student must be knowledgeable in the ethical

and sociopolitical implications of electronic environments. To make good value judgments, students must grasp the central issues concerning fair use, copyright, right to privacy, security, and censorship.

The committee is currently in the process of creating an implementation plan for offering and assessing computer competency and information literacy skills. Upon the approval of the senate and the president, the committee will prepare the delivery and assessment mechanisms for the literacy requirement to be effective in the fall of 2005.

CSUB's technology staff works directly with librarians and the faculty of the Teaching and Learning Center (TLC) to help incorporate technology into the curriculum. Web Services actively participates in training and technical support for faculty Web sites and the campus learning management system, WebCT, which delivers all or part of a course online. Librarians and IT specialists are working together to integrate library databases into discipline-specific online and Web-enhanced courses.

To provide ongoing support in information and computer literacy, Information Resources created the Student Help Desk, Student Assistant Program, and the Student Scholar Training Program. The Student Help Desk provides assistance to staff and students in the use of technology tools, providing assistance in all areas of technology from smart (technology-enabled) classrooms to Web design.

The Student Assistant Program leverages one of our most valuable resources—our students. Students are hired and trained to work as technology helpers for the library, Web designers, WebCT designers, instructional television aides, smart classroom aides, and staff in other areas of campus. This program has helped not only our campus faculty, students, and staff but also gives these students hands-on training in technology fields that facilitate their education and prepare them for future careers.

The Student Scholar Program was designed to offer general-education computer skill courses to assist enrolled students in meeting the information competency requirements prior to graduation. It also helps students retain and increase their skills and offers an environment that provides “real world” work experience to student trainers.

What It Means to Higher Education

Higher education must continue to create learning environments for students that encourage information and computer literacy. This entails a continued commitment to improving the technological infrastructure as well as an obligation to support instructional models, programs, and incentives that will teach students how to retrieve, evaluate, and manage information. As higher education becomes increasingly experienced in developing learning environments for information literacy, it must remain vigilant in assessing the learning outcomes of the courses and programs that deliver these information competencies.

It is not unreasonable to expect that information literate students will be more inclined to extend their learning beyond their school years, into their jobs and social, political, and family life. Such students are more likely to continue learning throughout their lives as

they respond to a rapidly changing society. Corporations, frustrated with traditional education, are concerned that although students are exposed to technology, they are not learning the necessary skills to solve problems, think abstractly, manage information, make sound judgments, or generate new ideas.

Institutions of higher education increasingly are being held accountable for graduating students who are competent knowledge workers able to sift through superfluous data to select and communicate high-quality information. Moreover, employers expect workers who continue learning beyond college to be valuable resources contributing to productivity and profit.

The importance of information literacy extends beyond cultivating information-competent students and employees. It includes educating responsible and informed citizens whose information literacy skills empower them to make astute judgments about local, national, and international issues, as well as policies and policymakers.

Key Questions to Ask

- What information do decision makers need in order to assess the appropriate level of information literacy programs for the academic curriculum?
- What can campus policymakers do to increase information literacy instruction?
- How can a campus effectively integrate information literacy into the curriculum?
- What forms of planning, governance, and organization will help engage IT specialists, librarians, faculty, and administrators in the planning and implementation process?

Where to Learn More

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Endnotes

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About the Authors

At California State University, Bakersfield, Wendell Barbour (wbarbour@csub.edu) is Vice President for Information Resources and Chief Information Officer; Christy Gavin (cgavin@csub.edu) is Librarian and Professor; and Joan Canfield (jcanfield@csub.edu) is Director of E-Services.

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