Implementing an Embedded Information Literacy Program at the University Level: Best Practices

Ann Agee, San Jose State University

Available at: https://works.bepress.com/ann_agee/6/
Implementing an
Embedded Information Literacy Program
at the University Level:
Best Practices

Prepared for the

Dr. Martin L. King, Jr. Library
San Jose, California

September 28, 2007

Prepared by Ann Agee

Prepared in Partial Fulfillment of the
Requirements for a
Master of Library & Information Science Degree
Executive MLIS Program
School of Library & Information Science
San Jose State University
San Jose, CA 95192
Cover Letter

This is to acknowledge the completion of the Organizational Consulting Project, *Implementing an Embedded Information Literacy Program at the University Level: Best Practices*.

Mary Somerville, Associate Dean  
Date

Rebecca Feind,  
Information Literacy and Campus Outreach Coordinator  
Date

Ann Agee, Consultant  
Date

Joe Matthews,  
Organizational Consulting Project Coordinator  
Date
Acknowledgements

I would like to thank Mary Somerville, Associate Dean, and Rebecca Feind, Information Literacy and Campus Outreach Coordinator, of San Jose State University’s Dr. Martin L. King, Jr. Library for their time, their help and their guidance in the creation of this report. They provided me with insight and enlightenment on the workings of both the university and the library.

I would also like to thank my family for their support and patience through the long gestation of this project and through the even longer two years of my master’s program.
# Table of Contents

Executive Summary ........................................................................................................................ 8  
The Campus and Its Challenges .............................................................................................. 8  
Embedded Information Literacy Program Design ................................................................. 9  
Embedded Information Literacy Program Models ............................................................... 10  
Organizational Change ........................................................................................................... 11  
Assessment ............................................................................................................................... 12  
Best Practices .......................................................................................................................... 13  
Recommendations .................................................................................................................... 14  
Summary .................................................................................................................................... 17  
Introduction .............................................................................................................................. 18  
San Jose State University .......................................................................................................... 19  
The Campus ............................................................................................................................. 19  
The Library ............................................................................................................................... 19  
Information Literacy at SJSU Today .......................................................................................... 20  
Information Literacy Defined ................................................................................................. 20  
Current Information Literacy Instruction .................................................................................. 21  
Current Library Staffing and Outreach .................................................................................... 22  
Current Assessment Programs ............................................................................................... 23  
Problem Definition ................................................................................................................... 24  
Project Objectives .................................................................................................................... 26  
Organization of the Report ....................................................................................................... 27  
Research Methodology ............................................................................................................. 28  
For-Credit Courses .................................................................................................................... 28  
Workbooks ............................................................................................................................... 28  
Online Tutorials ....................................................................................................................... 28  
One-Shot Lectures .................................................................................................................... 29  
Embedded (Course-Integrated) Instruction ............................................................................ 29  
Report Focus ............................................................................................................................. 29
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Situation Analysis</td>
<td>31</td>
</tr>
<tr>
<td>Information Literacy at CSU: A Historical Perspective</td>
<td>31</td>
</tr>
<tr>
<td>Institutional Challenges</td>
<td>32</td>
</tr>
<tr>
<td>Faculty Attitudes toward Information Literacy</td>
<td>33</td>
</tr>
<tr>
<td>Faculty Attitudes toward Librarians</td>
<td>34</td>
</tr>
<tr>
<td>Librarians’ Attitudes toward Faculty</td>
<td>35</td>
</tr>
<tr>
<td>Librarians’ Attitudes toward Information Literacy</td>
<td>36</td>
</tr>
<tr>
<td>Students’ Attitudes toward Information Literacy</td>
<td>37</td>
</tr>
<tr>
<td>Dissenting Voices</td>
<td>38</td>
</tr>
<tr>
<td>Research Findings</td>
<td>41</td>
</tr>
<tr>
<td>Embedded Information Literacy Program Design</td>
<td>41</td>
</tr>
<tr>
<td>Case Studies</td>
<td>44</td>
</tr>
<tr>
<td>University of Rhode Island</td>
<td>44</td>
</tr>
<tr>
<td>University of Melbourne</td>
<td>45</td>
</tr>
<tr>
<td>California Polytechnic State University, San Luis Obispo</td>
<td>47</td>
</tr>
<tr>
<td>Florida International University</td>
<td>49</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>50</td>
</tr>
<tr>
<td>Transfer Students</td>
<td>51</td>
</tr>
<tr>
<td>Collaboration</td>
<td>52</td>
</tr>
<tr>
<td>Staff Development in the Library</td>
<td>56</td>
</tr>
<tr>
<td>Embedded Information Literacy Program Models</td>
<td>59</td>
</tr>
<tr>
<td>Information Literacy Instruction for Students</td>
<td>61</td>
</tr>
<tr>
<td>Active Learning</td>
<td>61</td>
</tr>
<tr>
<td>Problem-Based Learning (PBL)</td>
<td>61</td>
</tr>
<tr>
<td>Interactive Lectures</td>
<td>64</td>
</tr>
<tr>
<td>Overview of Active Learning</td>
<td>65</td>
</tr>
<tr>
<td>Information Literacy Instruction for Faculty</td>
<td>65</td>
</tr>
<tr>
<td>Organizational Change</td>
<td>71</td>
</tr>
<tr>
<td>Balanced Scorecard</td>
<td>72</td>
</tr>
<tr>
<td>Learning Organization</td>
<td>74</td>
</tr>
<tr>
<td>Star Model</td>
<td>75</td>
</tr>
</tbody>
</table>
List of Figures and Tables

Table 1: Formal and Informal Internal/External Factors Affecting the Creation and Implementation of a Campus-Wide Information Literacy Program ................................................. 43
Figure 1: University of Melbourne—Information Division: Departmental Chart ......................... 46
Figure 2: SJSU Academic Success Campus Partnership Model .................................................. 56
Table 2: Learning Styles ............................................................................................................... 60
Figure 3: The Problem-based Learning Cycle .............................................................................. 62
Figure 4: The Star Model .............................................................................................................. 76
Figure 5: Google This! Sample Portfolio ...................................................................................... 88
Table 3: Advantages and Disadvantages of Surveys .................................................................... 90
Executive Summary

Information literacy is the ability of individuals "to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (American Library Association, 1989, para. 3). At San Jose State University (SJSU), information literacy has been traditionally taught through one-shot, 50-minute lectures delivered by university librarians to students enrolled in a select few undergraduate courses. This method of instruction has proven to be neither sustainable nor effective. The lectures are not tailored by discipline and students might receive the same lecture several times while completing their lower-division coursework.

SJSU wants to replace this format with an embedded information literacy program, one in which the teaching of information literacy skills is integrated into courses throughout the curriculum. As students progress from lower- to upper-division courses, their information literacy proficiency would become increasingly sophisticated. What is driving this increased emphasis on information literacy are regional accreditation requirements; the need to keep pace with the changes brought to teaching and learning by new technology; and society’s need for graduates who have lifelong learning skills.

This Organizational Consulting Project examines the information literacy literature produced from 2002 to 2007 in order to explore how other universities have handled a similar transition and discover best practices appropriate to SJSU. The specific areas examined are information literacy program models and program design, organizational change, and assessment methods.

The Campus and Its Challenges

SJSU is one of 23 campuses in the California State University (CSU) system and has an enrollment of approximately 30,000 students. The eight-story Dr. Martin L. King, Jr. Library is the university’s only library. It is a dual-use facility that also serves as the main branch of the San Jose Public Library System. The King Library has 23 academic librarians who act as liaisons to several academic departments each.
Although the King Library has been given the mandate to implement the information literacy program at SJSU, it has to first overcome several issues. The library needs to find an effective way to collaborate with faculty and educate them in how to successfully incorporate information literacy components into their course curriculum. In addition, university librarians require training in instructional design and educational technology before they can effectively support faculty information literacy efforts.

The library must also deal with a strained organizational culture in which faculty members may not regard librarians as their peers, and librarians view faculty as arrogant and apathetic. Also, both faculty and librarians may view the drive for information literacy as a time-consuming educational fad, rather than a necessity like mathematics or writing. Faculty, especially, often feel that students will pick up information literacy skills on their own. On their side, students feel they do not need information literacy instruction because of their Internet search abilities and general ease with technology. This report will provide recommendations on how these various challenges may be overcome.

**Embedded Information Literacy Program Design**

There is strong support in the library literature for embedded information literacy programs. However, there are few cases of large, public universities that have successfully instituted them. Some examples do exist, however. These include the University of Rhode Island, the University of Melbourne, Cal Poly San Luis Obispo and Florida International University.

At the University of Rhode Island, information literacy was introduced into the curriculum in stages: first, in courses that traditionally offered library instruction; next, in General Education courses that required information technology skills; and finally, in capstone courses in each college program.

At the University of Melbourne, the transition began when the library, which is part of the university’s Information Division, was reconfigured. Reference librarians became information specialists and in these new roles worked with faculty to integrate information literacy competencies into departmental programs. The university’s new Melbourne Model of education now includes information literacy in its interdisciplinary curriculum.
At Cal Poly San Luis Obispo, systems thinking was used to aid the transition to embedded information literacy instruction. By viewing the library as one large interconnected system, it was discovered that paraprofessionals could handle the majority of the reference desk duties. This freed librarians to work with faculty to incorporate information literacy standards into their programs.

The Florida International University information literacy plan began with a Library Certification Program, which was mandatory for all freshmen. The librarians then began work on the core curriculum and collaborated with faculty to create assignments and determine course objectives that emphasized information literacy skills. They also partnered with the campus’s Academy for the Art of Teaching and worked together to train faculty in information literacy competencies. In addition, they tied their information literacy agenda to several popular, university-wide programs, such as campus accreditation, which helped advance their cause.

When creating an embedded information literacy program, it’s important to ensure that transfer students also receive appropriate training. Generally, the most common way to do this is to require the completion of a rigorous online information literacy tutorial.

At all of the universities that have embedded information literacy programs, collaborating with faculty, administration and other university departments has proven to be vital. Librarians need to keep a high profile by attending both departmental and campus-wide meetings so they can become part of campus decision-making. When collaborating with faculty, librarians need to speak the same language and market information literacy components to them in a discipline-specific way. It’s also important that they respect faculty members’ time and expertise.

Before librarians can become effective collaborators, however, they must become trained in educational technology and instructional design techniques. To avoid the cost of commercial training programs, it’s suggested that the library partner with SJSU’s College of Education or adapt web-based tutorials offered online. A strong staff development program at the library will lead to increased job satisfaction for librarians and a positive organizational culture.

*Embedded Information Literacy Program Models*

When teaching information literacy, it’s important to reach students with all types of learning styles—visual, auditory and kinesthetic. Active learning techniques ensure that all these types of learners become involved in their own education, and these techniques are very well
suited to teaching information literacy skills. The active learning technique called problem-based learning is specifically recommended. This style of teaching presents students with a “messy” problem that has no simple answer and requires research to resolve. In this mode of learning, instructors become coaches and guides and assist students in their research, which is generally done in groups. The active learning technique of cooperative learning is also suggested. It enhances group work by giving each member a necessary role; grading members separately, not as a group; and ensuring that groups are mixed by gender, race and ethnicity.

For instructors more comfortable with lecturing, interactive lectures bridge the gap between straight lecturing and active learning techniques. An interactive lecture intersperses lectures with hands-on activities, a short writing assignment or group discussion. In this way, students are kept focused and attentive.

In addition to students, faculty members need to be taught information literacy skills. Often it is hard to reach faculty because of the many pressures on their time, so it is suggested that instruction be offered in a variety of formats—videos, online tutorials, podcasts, or workshops. When possible, a discipline-specific approach should be used. To motivate faculty, it’s important that the administration support the need for information literacy within the curriculum. Librarians, too, need to sell the information literacy message by attending departmental meetings whenever possible.

Organizational Change

There are three change management techniques that have been used successfully by academic libraries to transform their organizations—the balanced scorecard, the learning organization and the Star Model.

The balanced scorecard uses a set of quantifiable measures that are established by an organization’s strategic plan. It looks at four dimensions of the organization: (1) employee learning and growth, (2) internal processes, (3) customer perspective, and (4) financial perspective. Metrics are established for each of these areas and data is collected to see how well they are met. The data is reviewed—usually on an annual basis—and adjustments made, so the library is continuously improving. This is a time-consuming technique but offers measurable goals that are easy to communicate, and it remains a popular choice for managing change.
The learning organization concept was popularized by Peter Senge and is based on five principles: personal mastery, mental models, shared vision, team learning and systems thinking. A shared vision guides the change process and employee teams work together to solve organizational problems. Systems thinking—viewing the organization as a system where everything is interrelated—is encouraged. The assumptions held about the organization, known as mental models, are addressed, and change and learning are encouraged as cultural norms. Employees are also encouraged in their journey toward personal mastery, which entails clarifying the way they regard their responsibilities and focusing their energies in a positive way.

The Star Model divides organizations into five policy areas and demonstrates how they interrelate and influence each other, like the five points of a star. These areas are strategy, structure, processes, reward systems, and human resources policies. By employing these policies to manage two critical components of change—performance and culture—the Star Model offers a streamlined approach to organizational transformation.

Within any change model, organizational culture is a major part of the success or failure of a change initiative. To address the specific cultural challenges facing the King Library—the attitudes of faculty, librarians and students toward information literacy and each other—there are several factors that need to be emphasized. These include demonstrating mutual respect and the importance of communication, education, and collaboration to advancing this respect.

Assessment

There are several information literacy program assessment tools available. These include iSkills™, the Standardized Assessment of Information Literacy Skills (SAILS), and the Information Literacy Test (ILT). SAILS and ILT are both multiple choice tests, but the iSkills™ test uses practical, scenario-based questions. These questions require students to use common software applications—word processing, spreadsheets, and email—to effectively collect, analyze and apply information. Because iSkills™ tests both practical and conceptual information literacy skills, it is recommended as the best assessment tool for evaluating the information literacy program at SJSU.

To measure learning outcomes, there are many assessment techniques. Self-assessment assignments, portfolios, the Paper Trail and surveys all offer effective ways to assess student
learning outcomes in courses demanding information literacy skills. The choice of method should be determined by the type of class and the instructor’s preferences.

Best Practices

Section 1: Information Literacy Program Design

When designing an embedded information literacy program:

- Create a roadmap for implementation that keeps change steady and gradual, working from individual courses up to the curriculum level;
- View the university as a system and stay sensitive to how each change can affect all the parts;
- Borrow institutional energy from already popular initiatives;
- Maintain a high profile on campus, attending departmental and administrative meetings;
- Practice respect and communication; and
- Reduce duplication of effort by consolidating all departments responsible for managing information—web design, telecommunications and libraries—into a single division.

Section 2: Information Literacy Program Model

When determining the educational model for an embedded information literacy program:

- Diversify instruction techniques in order to reach all styles of learners—auditory, kinesthetic and visual;
- Incorporate problem-based learning in order to help students learn by doing;
- Inform instructors of discipline-specific ways active learning techniques can be used;
- Educate instructors about techniques that bridge the difference between active and traditional teaching styles, such as interactive lectures; and
- Provide faculty training opportunities in a variety of formats to make them as accessible as possible.
Section 3: Organizational Change

When implementing change within the library:

- Follow the principles of the learning organization: systems thinking, team learning, shared vision, mental models and personal mastery;
- Demonstrate respect to faculty members by involving them at every stage of the change initiative;
- Communicate constantly using a variety of means—emails, wikis, listservs, flyers and meetings;
- Present information literacy as a unifying cause with the goal of creating lifelong learners; and
- Initiate collaborations with departments at every level of the university.

Section 4: Assessment

When assessing the value of an embedded information literacy program:

- Employ ETS’ iSkills™ to assess the success of information literacy instruction on a programmatic level; and
- Educate instructors on different methods of assessing learning outcomes—surveys, portfolios, and self-assessment—and the discipline-specific ways they can be applied to assess information literacy on a course level.

Recommendations

In the area of information literacy program design, it’s recommended that SJSU consider the strategy practiced at the University of Rhode Island. There, information literacy components were introduced into the curriculum gradually: first in courses that traditionally included library instruction, next in General Education courses that demanded information technology skills, and finally in capstone courses within each college program. By providing this type of instructional roadmap to follow, librarians would be prevented from feeling overwhelmed and the gradualness of the change would perhaps make the program more acceptable across the campus. Although time consuming, the strategy would still result in a campus-wide embedded information literacy program.
A parallel recommendation is to work with the administration to bring all of SJSU’s information departments—the library, the Department of Academic Technology, University Computing and Telecommunications, etc—together into one division. This reorganization, like the one at the University of Melbourne, would reduce duplication of effort and enhance knowledge sharing. In the long term, it is also probable it would reduce costs.

Incorporating systems thinking, as was done at Cal Poly San Luis Obispo, and using other campus initiatives to promote an information literacy agenda, as was done at Florida International University, would both promote collaboration. In addition, systems thinking would encourage innovative thinking and problem solving among library staff.

To meet the needs of transfer students within its program, the library should offer a mandatory online tutorial that provides a thorough introduction to information literacy competencies. In this way, SJSU would be assured that all its students graduate with the lifelong learning skills they need and, in the long-term, would also improve the university’s student retention rates.

A takeaway from this report’s survey of on-campus collaboration is “meetings, meetings, meetings.” By maintaining a high profile and partnering with other campus departments, such as units of the Department of Academic Technology, librarians can help sustain the information literacy program. These forms of campus outreach will no doubt put a strain on librarians in the short run as their jobs change from an inward to more outward focus. But in the long term, keeping a high profile and consistently marketing the library “brand” will keep the library in the center of campus decision-making and demonstrate its openness to collaboration.

The many aspects of active learning presented in this report can all be recommended as effective means for teaching information literacy at SJSU. Active learning makes students responsible for their own education and is more likely to involve all types of learners—auditory, visual and kinesthetic. Problem-based learning, specifically, is extremely well suited to teaching information literacy skills. For faculty members not ready to let go of their lecture format, interactive lectures provide a bridge between lecturing and active learning.

The acceptance of active learning may vary from department to department. In the short run, librarians will be kept busy promoting discipline-specific applications of the technique in order to persuade instructors of its effectiveness. But by consistently employing the active
Implementing an Embedded Information Literacy Program

learning method, SJSU will graduate self-directed learners who are able to work well in groups, have improved retention of material, and demonstrate strong research and evaluation skills.

Information literacy instruction is also important for faculty. To encourage their participation, the SJSU administration should demonstrate its continuing commitment to implementing information literacy in the curriculum. Also, by tying information literacy goals to those of other popular campus programs, such as distance education, librarians can encourage faculty participation by helping them achieve their own instructional aims. The instruction itself should be provided in a variety of formats: workshops, seminars, web-based tutorials, videos or podcasts. This will make it easy for faculty to incorporate the training in their schedules. When well-versed in information literacy skills, faculty will be able to pass on their expertise to their students.

Of the change management models discussed, the principles of the learning organization are recommended as providing guidelines best suited to the King Library’s transformation. Those principles that guide a learning organization are systems thinking, team learning, shared vision, mental models and personal mastery.

By implementing the elements of the learning organization model, SJSU can become one of the organizations “that create a climate that fosters learning, experimenting, and risk taking” (Giesecke, 2004, pp. 54-55). In addition, it will develop employees “who appreciate change, accept challenges, can develop new skills, and are committed to the organization’s mission, goals, and objectives” (Giesecke, 2004, p. 55). Backed by this type of vibrant environment, the library’s information literacy initiative will thrive.

To enhance the organizational culture of the library and campus, the library should consciously work to demonstrate its commitment to mutual respect, communication, education and collaboration. The result of this would be a campus culture enriched and improved by the example it sets. In the short term, however, librarians will undoubtedly have to be encouraged and guided in their efforts to demonstrate these qualities in their interactions with campus faculty and staff.

On a program level, it is recommended that iSkills™ be chosen as the tool used for assessing information literacy competencies at SJSU. Although at $22.00 a test it is more expensive than alternative tests such as SAILS and ILT, iSkills™ offers a level of assessment that can’t be matched by simple multiple-choice exams.
To assess learning outcomes, it is recommended that the techniques used should be
guided by discipline. A reflective journal assignment might work best in a large sociology
course, while an electronic portfolio might be better suited to a small computer science course.
While all the techniques investigated—surveys, portfolios, the Paper Trail, and self-
assessment—are excellent assessment tools, it is ultimately the structure of the class and the
individual instructor that should determine which one is employed.

Summary

To reach their goal of an embedded information literacy program, the librarians at SJSU
still have a lot to accomplish. It’s important for them to remember that by giving students the
ability to navigate the information ocean, they are making a positive difference in their
community and the world, because inextricably bound up in the growth of information literacy is
the growth in self-understanding and humanity (Ward, 2006). And that is certainly a goal worth
working toward.
Introduction

As colleges and universities continue along the path of educational reform that enhances student learning, the library must become formally incorporated into new institutional structures. The boundaries presently separating the library from academic departments, and those separating librarians from faculty and students, will become more permeable. Librarians with a broad understanding … of information literacy will become partnered with classroom faculty, technologists, student affairs personnel, and students in a seamlessly integrated curriculum. (Ward, 2006, p. 402)

Information literacy is the ability of individuals "to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (American Library Association, 1989). It is the foundation for lifelong learning, a necessity for modern life, and academic libraries across the country are working hard to incorporate information literacy into university and college curriculums.

San Jose State University (SJSU) is no exception. As part of the California State University (CSU) system, SJSU has been involved in the information literacy movement since the 1990s (Curzon et al., 2001). Currently, the university is exploring how to incorporate information literacy into every level of its curriculum. For its guiding principles, SJSU is using the Association of College and Research Libraries’ (ACRL) “Characteristics of Programs of Information Literacy that Illustrate Best Practices: A Guideline” (see Appendix A). This list of recommendations seeks to “articulate elements of exemplary information literacy programs for undergraduate students at four-year and two-year institutions” (ACRL, 2007a, para. 1).

The purpose of this Organizational Consulting Project is to explore how these ACRL best practices are being applied—and perhaps improved upon—at universities with embedded information literacy instructional programs. The time period examined is 2002 to 2007. This report’s specific objectives are to discover what information literacy program models are in use; to explore the elements of their design; and to determine how these elements might be used to enhance the information literacy program offered at SJSU and coordinated by the academic librarians at SJSU’s Dr. Martin L. King, Jr. Library. This report also explores how universities...
assess the effectiveness of their programs and what change management techniques can be used when implementing new programs.

San Jose State University

The Campus

SJSU is one of 23 campuses in the CSU system. Located in downtown San Jose, SJSU offers bachelor’s and master’s degrees in 134 areas of study and has a total enrollment of 29,604 students (SJSU, 2006, Student Quick Facts). The university is composed of seven colleges: Applied Science and Arts; Business; Education; Engineering; Humanities and the Arts; Science; and Social Science. With more than 1,500 faculty members, SJSU prides itself on the quality of its teaching and its small class sizes.

The student body at SJSU is very diverse. Ethnically, 24% of SJSU students are Asian, 28% are white, and of the remainder, Mexican-Americans make up the largest group with 15% of the student population (SJSU, 2006, Student Quick Facts). Proportionally, undergraduates make up 76% of students; the remaining 24% are graduate and credential students. The students’ age range breaks down in similar proportions: 79% are under 30 and 21% are over 30. Over half of the students come from Santa Clara County and 40% come from elsewhere in California. Only 6% of the student body comes from out of state.

The Library

The Dr. Martin Luther King, Jr. Library opened in 2003 (SJLibrary.org, 2007a). A unique collaboration between SJSU and the city of San Jose, the King Library is a joint public/university venture, serving as both the main branch of the San Jose Public Library (SJPL) system and the university library. Located on the SJSU campus, it has eight floors and over 475,000 square-feet of floor space. The library collection is made up of more than 3 million popular and scholarly books and 388,000 DVDs, CDs, films, and videos (Somerville, personal communication, January 20, 2007). In 2007, library circulation exceeded the 50 million mark. The King Library also has a large number of digital resources, which include nearly 55,000 e-journals, over 5,000 e-books and more than 100 research databases. Other web-based services include 24/7 research
assistance. The library provided 2,200 librarian-mediated chat and “co-browsing” sessions last year, complementing 700,000 unmediated electronic database uses.

Information Literacy at SJSU Today

Information Literacy Defined

Information literacy is the ability of individuals "to recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information" (American Library Association, 1989). This succinct definition outlines what information literacy is, but it is equally important to understand what information literacy is not. It is not simply the ability to use or program a computer (Breivik & Gee, 2006). Although the ability to use technology is key to locating information today, most designers of information literacy programs incorporate this skill but do not strive to teach it. It is not simply skills-based (Breivik & Gee, 2006). Although the mechanical abilities of searching for and retrieving data are important to information literacy, the concept’s real impact is in teaching students how to understand, evaluate and apply the information they locate.

As Ann Grafstein (2002) writes, “Almost without exception, the literature notes that the ultimate goal of [information literacy] is to impart the skill of lifelong learning or learning how to learn” (p. 199). This is an ambitious mission, but with the astounding rate of change in technology and in the workplace, learning how to learn is an essential skill universities must pass on to their graduates. And as Ken Kempcke (2002) argues, “[Information literacy] shouldn’t provoke arguments over ideology and the curriculum. It is a fundamental skill, like writing, speaking, and mathematics” (p. 539).

For American universities, the information literacy movement began in earnest in the 1990s (Breivik & Gee, 2006). However, information literacy has a presence not only on the national educational scene but internationally as well. In their 2006 article, Bill Johnston and Sheila Webber provided a summary of information literacy organizations worldwide (p. 114). Included on their list is the International Federation of Library Associations (IFLA), which has a section on information literacy, and the World Library and Information Congress, which has a forum for information literacy practice and research. In 2003, a meeting of Information Literacy Experts was put on by UNESCO and the United States National Commission on Libraries and
Information Science. This meeting produced the Prague Declaration on Information Literacy and was followed by further meetings in 2005, one in Paris and a second in Alexandria, which produced a statement on information literacy to be presented at the World Summit on the Information Society.

In addition to these international groups, there are also several national information literacy organizations. In the United States, the American Library Association (ALA) and LOEX sponsor information literacy conferences. There are WILU conferences (Canada), Les Rencontres FORMIST (France), eLit (UK) and the International Lifelong Learning conference (Australia). Online there are a large and growing number of wikis, blogs and virtual communities devoted to the topic of information literacy. Demonstrably, information literacy is a concept whose time has come.

**Current Information Literacy Instruction**

Currently at SJSU, the librarians at the King Library provide in-class information literacy instruction to students in three courses (Somerville, personal communication, January 20, 2007):

- **English 1B**: The second in SJSU’s lower-division composition sequence, one of English 1B’s requirements is proficiency in basic library research skills.
- **MUSE**: Metropolitan University Scholar’s Experience (MUSE) is a university program designed to help first-year students succeed in college. MUSE workshops often feature presentations on information literacy.
- **100W**: Part of SJSU’s General Education requirement, the 100W courses differ from department to department but all require advanced proficiency in college-level writing and research strategies.

The in-class instruction offered by SJSU librarians in these courses takes the form of a 50-minute lecture and is given only at faculty request. Topics covered include search strategies for finding books and articles, how to use Boolean operators, and how to evaluate resources. In addition, librarians offer information literacy instruction upon request to upper- and lower-division undergraduate courses, as well as to graduate research methods classes.

Supplementing the lectures are four online tutorials:

- Five Ways to Find Articles and Books
- SJSU InfoPower
Implementing an Embedded Information Literacy Program

- SJLibrary Library Basics
- Plagiarism

In addition to these general information literacy tutorials, three discipline-specific tutorials for use in the 100W courses have been developed for the Business, Computer Science and TV/Radio/Film/Theatre departments. A Biology tutorial is also currently under development. Additional supplements to in-class presentations include printed instructional materials and individual assistance at the reference desk.

In 2004, the campus received grants to integrate information competencies into the departments of History and TV-Radio-Film-Theater (CSU, 2007). Independently, SJSU has also created information literacy programs in the Art, Biology, Business, English and Engineering departments (SJLibrary.org, 2007b). Because the majority of these attempts were contingent on one-shot grants, most of them lacked sustainability. (Somerville, personal communication, May 29, 2007). The struggle to keep these programs viable highlights the need for systemic change at the university. To truly incorporate information literacy into the curriculum campus-wide, comprehensive changes need to be made to how courses are constructed and taught.

Current Library Staffing and Outreach

SJSU currently has 23 academic librarians who serve as liaisons to several academic departments each. This spring, the librarians were organized into four teams based on discipline: Arts and Humanities, Social Sciences, Science and Health, and Professional Schools (Somerville, personal communication, June 26, 2007). These teams of five to six librarians support each others efforts and pool their knowledge in order to better support faculty and student research and instruction.

Librarians are responsible for giving information literacy lectures, creating and maintaining a subject web page for each of their assigned departments, selecting and placing purchase orders for appropriate materials, communicating regularly with department representatives, and monitoring the materials budgets for each department (SJSU Librarian Liaison Responsibilities, internal document, last updated August 17, 2006). In addition to their liaison duties, librarians also work at the King Library reference desk and assist students in their research.
Additionally, the librarians offer workshops through the Center for Faculty Development on topics such as plagiarism and advanced research techniques. They also assist new faculty in learning about the library’s resources at the annual New Faculty Orientation. For students, the librarians supplement their presence at the King Library by maintaining a reference desk at the Academic Success Center, a collection of student-support services located on-campus in Clark Hall.

In addition to SJSU’s academic librarians, the campus has also created an Information Literacy and Campus Outreach Coordinator position (Breivik & McDermand, 2004). This position was recommended in the ACRL’s Guidelines for Instruction Programs in Academic Libraries (June 2003), and its purpose is “to build collaborations across the campus—especially with faculty” (Breivik & McDermand, 2004, p. 210). One of the outreach librarian’s primary goals is to integrate information literacy education and assessment into the curriculum. To this end, the outreach librarian supplies the librarian teams with information on the latest information literacy techniques and works with faculty to help them incorporate information literacy into their individual courses.

Current Assessment Programs

The efficacy of SJSU information literacy instruction is assessed in two ways (SJSU Information Literacy Competence Program Mission Statement, memo, n.d.):

- **InfoPower Statistics**: This online tutorial contains a quiz. The results of the quizzes are analyzed to determine students’ knowledge of library resources.
- **English 1B**: Faculty and students are given an evaluation form at the end of the class to determine their satisfaction with their learning experience and the teaching methodology.

These statistics have been gathered for several years and do provide a snapshot of students’ abilities in their freshman year. However, there is no way of determining if students’ information literacy skills improve after that time or if they decrease or remain static. With the essential skills of lifelong learning at stake, a better way to assess student learning is vital.
Problem Definition

Currently, the library is reconsidering its approach to information literacy. In 2005-2006, about 800 information literacy lectures were delivered to 20,000 students (Somerville, personal communication, January 20, 2007). While the numbers are impressive, the delivery strategy is neither sustainable nor effective. These lectures are not tailored by discipline and students might receive the same lecture several times while completing their lower-division coursework. In addition, current research on effective teaching methods for today’s college students favors course-integrated approaches, including delivery by academic faculty rather than “one-shot” librarian instructors (Somerville, personal communication, January 20, 2007).

The current goals of the University Library Board are to (SJSU Achieving Greater Expectations Institute, Team Charter, memo, January 2007):

- Design collaborative new ways for faculty and librarians to work together to achieve improved faculty and student information literacy competence.
- Deepen and expand relationships between librarians and faculty, guided by insights from research on student information needs.

So SJSU’s major goals are to increase faculty/librarian collaboration and move the instructional literacy program from a library-centric to a student-centric focus. Ultimately, this would result in the handing off of instructional responsibilities to faculty and would free librarians to pursue more targeted information literacy services, such as incorporating information literacy components into the university’s Learning Management Systems—Blackboard, Elluminate and WebCT—and assisting faculty with incorporating information literacy components into their course curriculums.

Another part of this instructional redesign is the creation of a framework of information literacy learning objectives that progress logically from lower- to upper-division coursework, a schema that is currently lacking (Somerville, personal communication, January 20, 2007). This structure is needed to ensure that students have mastered increasingly complex techniques of information finding and using before graduation. To use a definition from the Australian and New Zealand Information Literacy Framework, what SJSU wants to achieve is “embedded information literacy,” that is, “curriculum design where students have ongoing interaction and reflection with information” (Bundy, 2004, p. 6).
Complicating the design of this framework are transfer students who enter SJSU in their sophomore or junior years. Frequently, these students do not have the necessary grounding in the research skills they’ll need for the upper-division activities introduced in the 100W courses. The program will also need to refine the assessment strategies used to measure students’ progress. Ideally, this evaluation methodology would be designed by librarians and faculty together.

Accomplishing this significant redesign of the information literacy program will require extensive organizational change. Librarians will need training in instructional design and educational technology. They must also strengthen their ties with faculty and stay informed about department curriculum changes, accrediting agency standards, and other national standards. And faculty members will need help integrating information literacy fundamentals into their lesson plans and assignments. They’ll also need to be kept informed of all the library resources available to them (Somerville, personal communication, January 20, 2007).

So to summarize, the King Library needs to:

- Increase faculty/librarian collaboration
- Create a course-integrated approach to information literacy that progresses logically from lower- to upper-division coursework and incorporates pedagogy that optimizes student success
- Refine the assessment strategies used to measure students’ progress
- Implement a strong change management program.

Obviously, it’s a very challenging time at the King Library!
Project Objectives

In response to the challenges facing the library, this report examines current (2002-2007) best practices in embedded information literacy in the following areas:

- **Embedded information literacy program design**: how program models are planned and delivered, with emphasis on how librarian-faculty cooperation is achieved.

- **Embedded information literacy program models**: how universities—both national and international—are meeting the information-literacy needs of their students and faculty. Particular attention will be given to investigating how these program models meet the needs of all learners—visual, auditory and kinesthetic.

- **Assessment strategies and practices**: how libraries determine the efficacy of these program models with particular attention to curriculum-based assessments.

- **Organizational change**: how libraries effectively manage change when transitioning from one program model to another, with emphasis on getting buy-in from library staff.

Outcomes of this research include a presentation of how elements of these program models may be incorporated into SJSU’s current information literacy curriculum and suggestions for assessment strategies that can be used to determine the success of the new approaches. Also explored are change management techniques that could ease the transition from old to new program models.

Some potential benefits of this research would be enhancements to the new information literacy program being designed by SJSU librarians. Ideally, elements of the report will help the university in its goal of harnessing the talents of the King Library and SJSU faculty in meeting the information literacy needs of SJSU’s diverse student body.
Organization of the Report

This report is divided into the following sections:

- **Research Methodology**: A discussion of how information used in the report was gathered.
- **Problems and Issues Affecting Information Literacy Instruction at SJSU**: An examination of the factors that may affect the implementation of an embedded information literacy program at SJSU.
- **Research Findings**: This section provides the results of the research into embedded information literacy program design, embedded information literacy program models, organizational change models, and assessment techniques.
- **Best Practices and Recommendations**: This final section explores the best practices discussed in the report and provides specific recommendations for elements that might provide the greatest benefits to SJSU.

Also provided is an appendix that includes the ACRL’s Characteristics of Programs of Information Literacy that Illustrate Best Practices.
Research Methodology

When exploring information literacy instruction models, several possible approaches were available to SJSU:

- For-credit courses
- Workbooks
- Online tutorials
- One-shot lectures
- Embedded (course-integrated) instruction

For-Credit Courses

Information literacy competencies can be taught in single or multiple for-credit courses. Frequently these courses are presented as General Education requirements and prerequisites for graduation. Proponents argue that for-credit courses lend legitimacy to the subject of information literacy and ensure the time necessary to cover the subject thoroughly (Owusu-Ansah, 2004).

Workbooks

Probably the least common method of information literacy instruction, workbooks are still used in some smaller colleges. For instance, Cabrillo College, a small community college located in Aptos, California, offers Library 10, “a self-paced, workbook-based course designed to teach and strengthen the lifelong research and information literacy skills of college students” (Cabrillo College, 2003). More frequently, workbooks have been replaced with online tutorials.

Online Tutorials

Increasingly popular, online tutorials seem to many universities an ideal way to provide students with information literacy skills with a minimum of time and expense. Generally, these tutorials cover how to use the library, find articles, find books, do research and use the Internet. Sections are followed by a short quiz and the system notes the students’ scores and records that they have completed the tutorial. Available 24 hours a day, the tutorials can be completed at the students’ convenience.
One-Shot Lectures

As discussed earlier, this is the format currently used at SJSU. Librarians present 50-minute lectures that cover search strategies and how to evaluate resources. At SJSU, these lectures are usually given in English 1B courses, 100W courses and MUSE workshops. They are also presented in upper-division courses at faculty request.

Embedded (Course-Integrated) Instruction

Embedded information literacy integrates the teaching of information literacy skills into courses throughout the curriculum. With this model, increasingly sophisticated information literacy concepts are taught as students progress through their four-year program. It also ensures that the competencies are taught in a discipline-specific manner.

Report Focus

In the initial meetings to determine the content of this report, the clients requested that the project focus on embedded information literacy instruction with an emphasis on faculty-librarian cooperation and faculty development as well as active learning techniques and learner-centered instruction. The other potential methods of providing information literacy competencies—one-shot lectures, workbooks, online tutorials and for-credit courses—were ruled out by the clients and will not be explored in this report.

Information for this report was gathered through an exhaustive literature review of texts and journal articles published from 2002 to 2007. Research was limited to the past five years because the rate of change in this field is so rapid that older information literacy models quickly become obsolete.

Occasionally, investigations into the literature strayed outside this timeframe for these reasons:

- A historical perspective was necessary to fully explore a topic; or
- Practices and programs, although current, were described only on older web pages

Articles were gathered from the following databases:

- Academic Search Premier
- CINAHL Plus with Full Text
In addition to these sources, pertinent print and electronic texts from the King Library were reviewed. Also, university and professional organization websites were accessed. By following this methodology, it’s hoped that a well-rounded presentation of the creation and implementation of embedded information literacy instruction programs has been created.
Situation Analysis

There are several factors that have made changing SJSU’s approach to information literacy increasingly urgent. And there are some roadblocks that need to be addressed to successfully make this change. Following is a discussion of the elements contributing to SJSU’s information literacy challenge.

Information Literacy at CSU: A Historical Perspective

The current situation at SJSU is influenced by how information literacy has been handled by the CSU system as a whole. A look at the evolution of information literacy in the state system sheds some light on the present state of affairs on the SJSU campus.

CSU was one of the first state systems to recognize the need for incorporating information literacy into the curriculum. It was in 1993 that the CSU Council of Library Directors (COLD) first confronted the challenge. They gathered “to create a plan which would take the CSU libraries well into the twenty-first century” (Curzon et al., 2001, para. 1). The result was Transforming CSU Libraries for the 21st Century: A Strategic Plan of the CSU Council of Library Directors. COLD’s plan was approved by the Chancellor’s Office, and the CSU Information Competence Initiative came into being, a system-wide movement to incorporate information literacy into the curriculum (Curzon, 2002; Rockman, 2002b).

As Lorie Roth, Director of Academic Services and Professional Development at the CSU Office of the Chancellor, wrote (1999):

The explosion of information has made it impossible for subjects to be ‘covered’ in the classroom. As it is no longer possible to teach students a static subject that can be mastered during their college career, universities are turning their attention to the lifelong skill of learning how to learn; how to educate students to find, evaluate, and effectively use information that is constantly changing. (p. 43)

Springing from the Information Competence Initiative was the Information Competence Committee, consisting of “librarians (who have faculty status), discipline-based faculty members representing the Statewide Academic Senate, assessment coordinators, and senior-level administrators based on the campuses and in the CSU chancellor’s office” (Rockman, 2002b, p.
190). This eclectic group was tasked with deciding what practical measures were needed to implement the ideas presented by the library directors, and in 1995 it published *Information Competence in the CSU: A Report*. “The report … analyzed methods for implementing a program in information competence and discussed the issues, both cultural and academic, which would encourage or inhibit a program on information competence” (Curzon et al., 2001). With this report as its guide, CSU began the work of integrating information literacy into its curriculum (Dunn, 2001).

Grants were awarded to CSU applicants who submitted projects that were either multi-campus in design or contained a strategy to share information across campuses (Curzon, 2002). Projects funded by these grants included an online information literacy tutorial from Cal Poly San Luis Obispo; InfoRadio, short radio segments covering information literacy topics recorded at CSU Fresno; and several proposals to incorporate information literacy into specific academic disciplines (CSU Northridge University Library, 2002). To date, CSU has committed over a million dollars in funding information literacy initiatives across the system (Curzon, 2002).

Although well-meant and progressive, ultimately the CSU approach has been scattershot, peppering different campuses with different modes of delivering information literacy. Grants have been awarded to both faculty and librarians, but these one-time bequests make little accommodation for sustainability. It has been left to the individual universities to decide how to enact the systemic change that will update both pedagogy and curriculum to meet the demand for information literacy. At SJSU, it is the King Library that was given the mandate to be the information literacy authority (SJSU, 2004). So it is the library that must guide the campus into a future where information competence is as fundamental as reading and writing.

*Institutional Challenges*

Like universities worldwide, SJSU is faced with adapting to a number of new paradigms (European Commission, in Virkus, 2003, p. 101):

- The increased demand for higher education in a lifelong learning context
- The proliferation of places where knowledge is produced
- The reorganization of knowledge
Meeting these challenges requires that SJSU create graduates (and faculty) who are thoroughly information competent—something that cannot be achieved with a single 50-minute lecture.

Another obvious factor in the demand for change is the emergence of new technologies (Somerville, personal communication, January 20, 2007). The Internet and all its many applications means that the old teaching model of reserves-lecture-textbook is becoming increasingly irrelevant, and students need to be taught how to hunt on their own in the information jungle.

Supplementing these demands is pressure from outside agencies. In 2001, the Western Association of Schools and Colleges (WASC)—the accreditation agency for the CSU campuses—recognized the importance of information literacy in its Handbook of Accreditation (WASC, 2001). As part of its Standard 3, it asks the question:

How does the institution ensure that its members develop the critical information literacy skills needed to locate, evaluate, and responsibly use information? How does it utilize the special skills of information professionals to support teaching, learning, and information technology planning? (p. 37)

In order to better meet this standard, SJSU must have a more persuasive answer than it currently offers.

**Faculty Attitudes toward Information Literacy**

One barrier to updating departmental curriculum to include information literacy is faculty attitudes; this is because faculty members feel they’re already teaching information literacy (McGuinness, 2006). By providing assignments that require research and writing, many faculty members believe that students will pick up information literacy skills as they go along, just as they themselves did when they were in school (Badke, 2005).

That the information landscape is different than it was 20 years ago is unquestionable, and that students need to be taught information navigation and evaluation skills might be considered self-evident. But it’s not surprising that some faculty members are unaware of the new importance of information literacy. Peer-reviewed papers on the subject appear almost exclusively in library journals, with only occasional appearances in education publications (McGuinness, 2006). A recent study of 54 non-library professional journals devoted to pedagogy
found that between 2000 and 2005 only 21 articles touched on the topic of information literacy (Stevens, 2007). So it comes as no revelation that the “sink-or-swim” model of information literacy remains prevalent on campus. A model “which is premised on the central assumption, or hope, that students are sufficiently independent-minded to seek assistance if necessary” (McGuinness, 2006, p. 578).

Another factor that prevents faculty from embracing information literacy is time. “Not uncommon is the attitude among faculty that information literacy is just another issue competing for their attention, an add-on to their overloaded courses that sounds as though it will necessitate even more work” (Shane, 2004, p. 98). Faculty must find time in their day for teaching, research, and academic committees as well as time to keep current with new developments in their field (McGuinness, 2006; Owusu-Ansah, 2004). That they are antagonistic to any new demands on their schedules can come as no surprise. There is also no reward to faculty for promoting information literacy. The traditional standards for determining tenure—teaching, service, and research and publishing—demand so much time that anything extra which doesn’t provide a direct benefit to a professor’s career is going to be slighted (Albitz, 2007).

Larry Spence, founding director of the Schreyer Institute for Innovation in Learning, might speak for all faculty members to all librarians when he writes:

Part of the problem is I want my students to exploit the new resources. I do not want to change the way I teach. Yet the novel situation disturbs my confidence as an expert in the classroom. More like an advanced student, I need consultants and partners—friendly helpers just will not do. (2004, p. 489)

Faculty Attitudes toward Librarians

Another consideration for the King Library is the faculty/librarian dynamic, a topic that receives a lot of attention in library journals. This is in itself is telling, because papers on the topic appear infrequently or not at all in other professional journals (McGuinness, 2006). Librarians often feel that faculty view them not as equals but as rarefied clerks. As one article states, “[C]onfusion about the librarian profession occurs because many of the visible library functions—circulation and interlibrary loan—are clerical in nature, and the actual work of professional librarians—teaching, research, and collection development—happens behind the scenes” (Reeves, Nishimuta, McMillan & Godin, 2003, p. 61).
Faculty also feel librarians are not their academic equals because they lack formal teaching experience, frequently don’t have doctoral degrees and often don’t have the professional publishing record of regular faculty (McGuinness, 2006; White, 2003). Faculty, one librarian complained, view librarians as simply “professional nice people, perceived by many as close to extinction, afraid to say no or offend” (Julien & Given, 2002, p. 81).

Faculty may also feel threatened by the new collaborative dynamic librarians are proposing. As Yale University Librarian Emeritus Scott Bennett reports from a workshop on incorporating information technology into the classroom:

["C"]ollaboration with students, librarians, and information technologists left faculty wondering what a classroom would look like and what teaching would mean if faculty were not the sole proprietor of the class…For faculty, then, sharing the stage requires a profound reexamination of their pedagogical identities. (2007, p. 153)

So in asking faculty to collaborate with them in the instructional design of their courses, librarians are asking for quite a major change—a reconsideration of what it means to be a professor.

At SJSU, librarians are designated as faculty; they are represented by the same union and have the same pay scale as all other faculty members. But despite their faculty status, it is very likely they will encounter faculty who regard them “not as colleagues but as info-servicers who try to sell [information literacy] like life insurance” (Kempcke, 2002, p. 532). Changing the minds of faculty members will be one of the major challenges of implementing a new information literacy program at SJSU.

Librarians’ Attitudes toward Faculty

Just as faculty have an engrained way of regarding librarians; librarians have strong—often unflattering—opinions of faculty. “[F]aculty are territorial and possessive about their courses, as well as being rude, uncooperative, arrogant and uncaring with regard to their students’ needs” (McGuinness, 2006, p. 574). This appalling diagnosis of faculty was taken from a popular academic library listserv. Although hopefully a minority opinion, this quote does reflect some of the issues that can arise when trying to enact librarian-faculty collaboration.

“[A] common thread in the [library] literature has largely focused on the perceived reluctance of the academic teaching staff to instigate the appropriate structural program changes,
which would permit the integration of [information literacy] with the teaching curriculum,” wrote Claire McGuinness in her study of faculty-librarian collaboration in Ireland (2006, p. 574). Librarians are often frustrated by this apparent apathy on the part of faculty and their own “lack of political leverage within the academic community” (McGuinness, 2006, p. 574). And a common opinion among librarians is that faculty members drag their feet at collaborating with librarians for fear of revealing their own lack of skill in using new technology in the research process (Badke, 2005; Hunt & Birks, 2004; White, 2003).

There is also a general feeling among librarians that faculty protect their exclusive right to teach and design curriculum at the expense of the greater good and resent any time taken from their discipline (Owusu-Ansah, 2004). As Julien and Given (2002) note:

By placing themselves in opposition to faculty members’ uncaring, questionable attitudes toward [information literacy], these librarians are also deliberately positioning faculty with an overtone of moral reproach—and consequently, positioning librarians as of a higher moral order with respect to students’ education. (p. 77)

The authors reached this opinion after analyzing seven years of posts to the Information Literacy Instruction Discussion List (ILI-L) listserv hosted by the ALA, and it sketches librarians as bringing a scolding, schoolmarm-ish tone to the information literacy movement. This is hardly the attitude of empowerment and professionalism that needs to be set in order to achieve librarians’ goals.

Sadly, as William B. Badke writes, “[Faculty and librarians] … exist in a context that is typified, to cite a Canadian expression, by ‘two solitudes.’ Faculty do not respect the roles of librarians, and librarians view faculty as arrogantly ignorant of the functioning of the library, its personnel and its tools” (2005, p. 65).

Librarians’ Attitudes toward Information Literacy

Although it would probably be difficult to find an academic librarian who would argue against the goal of information literacy, there is resistance to the change in focus that promoting information literacy demands. As quoted by Heidi Julien (2005), one librarian stated:

Info lit is great as a concept, but I feel it should stay primarily within the realm of the educational professionals, i.e. teachers and profs...My fear is that librarians, out of
professional insecurity, are moving away from what we do well and focusing on areas outside our expertise. (p. 309)

These “areas outside our expertise” include instructional design and Web 2.0 technologies, and admittedly, many librarians will require training to become proficient. It’s understandable that librarians with years of experience might well feel that this isn’t what they signed up for.

In addition to training, promoting information literacy demands an outward, extroverted orientation that emphasizes working with faculty, students and other librarians on a daily basis. This is a seismic shift from librarians’ traditional “inward focus on acquiring books and other printed materials” (Somerville, Huston & Mirijamdotter, 2005, p. 481). The majority of librarians are introverts and, although certainly capable of putting on presentations and workshops, may well find this work draining (Jennerich, 2006; Raspa & Ward, 2000).

In common with faculty who feel their pedagogical identities threatened, some academic librarians are dismayed and unnerved by the waves of change that are reshaping their profession. And this includes the information literacy movement. For these librarians, a defensive posture might well become their natural and enduring position.

Students’ Attitudes toward Information Literacy

Faculty and librarian attitudes are not the only challenges facing the proponents of information literacy. Students, too, have a very fixed mindset. Theirs is that they don’t need any instruction on how to find and use information because they already know how to do it (Bell, 2007; Julien, 2005; Macklin & Forsmire, 2004). The confusion arises from the belief that the ability to do a Google search is all that is required in research and the sum total of what it means to be information literate (Macklin & Forsmire, 2004). The effect of this conviction is predictable. Students’ “inflated confidence levels and familiarity with information technology hinder the effectiveness of typical library instruction sessions” (Macklin & Forsmire, 2004, p. 49).

Students’ “familiarity with information technology” often translates into a sense of technological superiority and further complicates the teaching of information literacy (Breivik & Gee, 2006). As Larry Spence (2004) writes, “The Internet is their library. They hang out in cyberspace reading what they want and learning on their own” (p. 488). With this level of
technological comfort, why listen to an instructor who might well know less about computers than they do?

But for all their technological self-satisfaction, students “tend to do research superficially, focusing on assignment requirements, familiarity, and convenience rather than looking for the best possible information to address their needs” (Holliday & Fagerheim, 2006, p. 171). This tendency of students for shallow research—choosing speed and convenience over substance and validity—is probably the biggest complaint among faculty from all disciplines (Holliday & Fagerheim, 2006). As Ed Tallent writes:

> Students do not know what resources we have, have little interest in learning about alternative titles, do not search resources effectively, feel overwhelmed by the amount of information available, lack the time and inclination to learn more, and assume we do not have titles and formats that we have collected for years. (as cited in Cox, 2006, p. 254)

In addition, students, who may be working, taking heavy course loads or otherwise dealing with too many demands on their time, are reluctant to invest effort in an area that won’t directly garner them a grade or other reward (McGuinness, 2006). And the active learning methods frequently employed in teaching information literacy mean students must become responsible for their own learning, an often uncomfortable transition for students who have been used to having knowledge handed down from above (Bennett, 2007; Johnson, McCord & Walter, 2003).

So to answer the question Ilene Rockman (2002a) poses in her article “The Importance of Information Literacy,” “How can one teach students to systematically find, evaluate, synthesize, organize, and communicate information ethically, legally, and appropriately?” (para. 6). The answer is: it’s not easy.

**Dissenting Voices**

In addition to roadblocks present in the campus culture, librarians at SJSU must also face dissenting voices in the wider library and education world. Arguments against information literacy in general and embedded information literacy in specific have both appeared in the literature and will no doubt arise as the library moves forward with its plans.

Embedded information literacy, some argue, is the most time-intensive and impractical of the potential educational alternatives, such as online tutorials, for-credit courses or workbooks.
An embedded approach requires “enormous and coordinated shifts in curricular emphases and resource allocation, none of which is either practical or politically realistic,” argues Stanley Wilder in his article “Information Literacy Makes All the Wrong Assumptions” (2005, p. 13). From encouraging faculty buy-in to offering faculty development sessions to attending administrative and departmental meetings, developing an embedded program puts a heavy burden on the librarians charged with implementing it. They must simultaneously maintain the support of the administration while breaking through the territoriality of individual academic departments.

And once the program is implemented, controlling the quality of instruction becomes extremely difficult. Although mandated with providing information literacy, the library has no jurisdiction over the faculty that would be carrying it out. With teaching left to departmental faculty with varying degrees of competence in information literacy topics, the library would have no direct influence on how well or poorly concepts were taught.

Steven J. Bell, director of the Paul J. Gutman Library at Philadelphia University, points out another potential problem with the embedded information literacy model from the learners’ point of view. That is, students could perceive the information being taught as simply a rehash of information presented in an earlier course (Bell, 2007). “From the students’ perspective,” he writes, “all [information literacy] instruction may appear to be the same” (Bell, 2007, p. 99).

Another argument against an embedded program is that it doesn’t serve the needs of all students. It may certainly be ideal for students who enter as freshmen and leave as seniors, but it’s easy to see how transfer students and graduate students could get slighted. It is for these students that some argue for a modular rather than a tiered approach (Jacobs, 2003). By offering information literacy concepts modularly in standalone courses “competencies are taught independently but ultimately have a cumulative effect” (Jacobs, 2003, p. 323).

Another charge against integrating information literacy concepts into the curriculum is that traditional, in-class instruction may not necessarily be the best vehicle for teaching information literacy concepts. In their 2006 article “Effective Methods for Teaching Information Literacy Skills to Undergraduate Students: A Systematic Review and Meta-Analysis,” Denise Koufogiannakis and Natasha Wiebe of the University of Alberta reviewed 55 articles on different types of information literacy instruction. They used as their criteria student outcomes as determined by their performance on pre- and post-tests, graded papers, or bibliographies.
What the authors discovered was that computer-aided instruction proved to be just as effective as traditional instruction in teaching information literacy concepts. Although 55 studies is an admittedly small sample size, the findings do raise questions about the necessity of launching the difficult and time-consuming process required for an embedded information literacy program when an online tutorial may do the job just as well with far less time and effort.

In a 2006 article, Jerry D. Campbell, the chief information officer and dean of University Libraries at the University of Southern California, makes these arguments against the need for teaching information literacy at all (p. 24):

- As the complex information environment becomes increasingly simplified, the need for instruction on how to navigate it becomes unnecessary.
- Vendors are increasingly marketing directly to readers and researchers, which makes library instruction irrelevant.

Stanley Wilder takes this technological argument one step further. Rather than “teach students the names of databases, the subjects and titles they include, and their unique protocols,” he suggests that libraries should put their energy into constructing “systems that eliminate the need for instruction” (Wilder, 2005, p. 254-255). In short, libraries should be putting their resources into creating technology that will make information literacy competencies superfluous.

These are just some of the dissenting views being voiced in the literature, and the debate rages on. Some of the opinions presented here arose when the library made its decision to proceed with an embedded information literacy instruction model, and they will no doubt arise again as the implementation of the program begins. Information literacy is a very new field as is the library’s role in providing it, and arguments and counter-arguments should be expected as the library moves forward with its plan. As Campbell writes,

Over the next decade, colleges and universities will have to make critically important practical and policy decisions about the function of libraries… and about the roles of librarians. If these decisions are made wisely, the academy may be able to maintain much of the ineffable, inspirational value associated with academic libraries while retaining their practical value through altogether transformed activities and functions built upon a new mission designed for a more digital world. (2006, p. 30)
Research Findings

Embedded Information Literacy Program Design

As discussed above, the type of embedded information literacy program that SJSU is planning has its opponents, but it also has many proponents. (Barnard, Nash & O’Brien, 2005; Grafstein, 2002; Harrison & Rourke, 2006; Hunt, 2004; Julien, 2005; Mackey & Jacobson, 2005; Shane, 2004). As Jordana Shane points out, “If the [information literacy] is seamlessly delivered via existing courses, there is no budget line to cut, there is no course to push through the approval process, no new faculty to hire” (2004, p. 101). An embedded information literacy program also provides a one-stop solution to a variety of campus concerns: “students’ technological fluency, issues of academic integrity, critical thinking, and skills involving the evaluation of information that has been retrieved from any number of different sources” (Shane, 2004, p. 92).

Some of the earliest adopters of embedded information literacy were schools of medicine and nursing because of the importance of the subject to the practice of evidence-based medicine. Evidence-based medicine, which became popular in the 1990s, is defined as "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research" (Sackett, as cited by Duke University, 2004). So, by definition, the research and evaluation skills taught as part of information literacy are vital to the practitioners of evidence-based medicine.

An example of an embedded information literacy program as practiced in the medical field can be found at the Queensland University of Technology (QUT) School of Nursing in Australia (Barnard, Nash, & O’Brien, 2005). Appropriately dubbed the “InfoLit Nursing Strategy,” it embeds information literacy learning objectives in each year of its nursing program, increasing “the complexity of learning activities and expectations of students’ performance from years 1 through 3” (Barnard et al., 2005, p. 508).

The following elements were incorporated in the School of Nursing’s curriculum (Barnard et al., 2005, p. 508):

- Identification of specific outcomes to be achieved
Focused learning activities that include the participation of library staff within the course

Development of exemplars for students at different levels in the course

Incorporation of information literacy outcomes within assessment items

Self-assessment activities for students to reflect on their learning

The program is a resounding success and just one segment of an impressive university-wide initiative. In fact, QUT’s information literacy program won a 2003 Australian Award for University Teaching and its website displays pages of academic testimonials from enthusiastic faculty (QUT, 2003).

Unfortunately, outside of the medical and health fields, there are few working models of the innovative program to which SJSU aspires. As Lindstrom and Shonrock (2006) note, “While learning communities and other vehicles of individual faculty-librarian collaborations have proven successful on a small scale, the goal of campus-wide and system-wide programs have, for the most part, remained unrealized” (p. 21).

As this report’s Situation Analysis showed, there are many factors that make implementing an embedded information literacy program difficult. Jordana Shane (2004) compiled all of these elements and created a table demonstrating the challenges to be faced when creating an information literacy program:
Table 1
Formal and Informal Internal/External Factors Affecting the Creation and Implementation of a Campus-Wide Information Literacy Program (p. 88)

<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formal</strong></td>
<td><strong>External</strong></td>
</tr>
<tr>
<td>Campus Governance Structure</td>
<td>ACRL Guidelines: “National Standards”</td>
</tr>
<tr>
<td>Librarian Faculty Status/Lack Thereof</td>
<td>IL Competency Standards</td>
</tr>
<tr>
<td>Institutional Mission Statement</td>
<td>IL Best Practices Guidelines</td>
</tr>
<tr>
<td>Library’s Mission Statement</td>
<td>Accrediting Bodies</td>
</tr>
<tr>
<td>Library Director’s Commitment Level</td>
<td>Statewide Mandates</td>
</tr>
<tr>
<td>Budgetary Constraints</td>
<td>Need for Information-Literate Workforce</td>
</tr>
<tr>
<td>Job Placements for Graduates</td>
<td></td>
</tr>
<tr>
<td><strong>Informal</strong></td>
<td>Peers’ Perceptions of Library/Librarians</td>
</tr>
<tr>
<td>Campus Culture and Politics</td>
<td>Graduates’ Perceptions of Library/IL</td>
</tr>
<tr>
<td>Librarians’ Leadership and Marketing Skills</td>
<td></td>
</tr>
<tr>
<td>Existing Collaborative Relationships</td>
<td></td>
</tr>
<tr>
<td>Collaborations in Development</td>
<td></td>
</tr>
<tr>
<td>Library’s Campus Image and Perceptions</td>
<td></td>
</tr>
<tr>
<td>Librarians’ Self-Image</td>
<td></td>
</tr>
</tbody>
</table>

It’s a daunting collection of issues. Add to them critics’ charges about the difficulty of controlling the quality of instruction, the need to guard against redundant instruction, the debates over the best instructional techniques and the necessity of making sure all students are reached, and universities are facing major challenges when they embark on an embedded information literacy initiative.

But despite the odds, there are some campuses that have tackled these challenges and succeeded. For the most part, these have been small colleges, such as Earlham College and Seattle Central Community College (Burkhardt, Rathemacher, & MacDonald, 2002; Shane, 2004). Examples of large, public institutions that have successfully embedded information literacy into their core curriculum are few. There have been some, however, and following are case studies of those institutions that have accomplished the transformation.
Case Studies

University of Rhode Island

In 1998, the University of Rhode Island (URI) University Library began a comprehensive plan to introduce information literacy into the campus curriculum (MacDonald, Rathemacher & Burkhardt, 2000). Like SJSU, URI offered one-shot library education lectures and, like SJSU, faced some of the same problems, such as some students receiving no library instruction at all and those who did retaining little of what they were taught. URI was also inspired by SJSU’s former university library dean, Patricia Breivik, and her pronouncement that “classroom business-as-usual cannot be tolerated on campuses that place a high value on student learning” (cited in MacDonald et al., 2000, p. 241).

URI’s approach to change was to introduce an “incremental, four-year-plus program for student mastery of information literacy concepts and skills” (MacDonald et al., 2000, p. 243). Their program had these objectives (URI, 2005, Objectives):

I. To offer programmatic, incremental, planned information literacy instruction
   a. Deliver information literacy concepts and skills programmatically through URI 101, the College Writing Program (WRT) and the Talent Development pre-matriculation program.
   b. Deliver course-related information literacy instruction in conjunction with credit courses in other programs and disciplines.
   c. Deliver credit-bearing information literacy courses.

II. Develop an undergraduate curriculum mapping project with three stages:
   a. Work to identify all courses that traditionally receive information literacy instruction from librarians. Further, to identify which information literacy standards are delivered in each of those courses.
   b. Identify General Education courses that have identified themselves as incorporating the “Use of information technology” skill and that are using Web-based research as their skill.
   c. Identify capstone courses in each college or program and act in a library liaison role to develop advanced information literacy opportunities for students involved in their capstone projects.
As mentioned above, freshmen receive basic information literacy skills through URI 101, a course which consists of “in-library instruction, a librarian-graded, in-class assignment included in the overall course grade, a brief tour of the library building and a follow-up assignment facilitated by the course instructor” (Burkhardt, MacDonald, & Rathemacher, 2005, p. 77). For students in their sophomore year, librarians are working with faculty to incorporate information literacy into required General Education courses by using research-based assignments and advanced subject-specific library instruction. At the junior level, information literacy is primarily provided through integrated instructional modules (Burkhardt et al., 2005). These modules are subject-specific toolkits that contain “information resources, research strategies, in-class exercises, and assignments geared to particular fields, instructional areas, and topics” (MacDonald et al., 2000, p. 246).

Seniors at URI are required to complete a capstone project in their major. Librarians are currently working to make portfolios or annotated bibliographies a component of these culminating projects in order to demonstrate students’ mastery of information literacy concepts (Burkhardt et al., 2005).

With an enrollment of approximately 16,000 students, URI is only about half the size of SJSU (URI, 2007). It is also divided into three separate campuses, each with its own library (Burkhardt et al., 2005). But although some of URI’s challenges differ from those at SJSU, both campuses serve many different types of students in a wide variety of majors. And URI’s strategy of structuring the delivery of information literacy by class level and discipline and then implementing its plan over a span of years is very practical and possibly worth imitating.

University of Melbourne

In their 2004 article “Information Literacy in the “E” Environment: An Approach for Sustainability,” Angela Bridgland and Martha Whitehead chronicled the creation of a system-wide information literacy program at the University of Melbourne in Australia. The university’s transition began in 2001 when the campus Information Division—consisting of the Library, Information Technology Services and the Multimedia Unit—was reconfigured into seven separate departments, one of which was the Teaching, Learning and Research Support department (see Figure 1). Within this department, the Learning Resources Services (LRS) unit was created.
LRS was staffed by twelve librarians from what had formerly been the reference services division of the library. Their new jobs also came with a new title: information specialist. These information specialists have three roles: educator (supporting the learning objectives of their assigned academic departments); information expert (staying up-to-date on the newest resources and techniques); and educational technology expert (staying current on changes in hardware and software). Significantly, the information specialists have no regular library duties. This allows them the time to focus on information literacy at a strategic, programmatic level. So as a group they are able to examine different pedagogical models and assessment approaches to information literacy instruction. Divided into three teams—Arts, Sciences, and Social Sciences—they also work closely with faculty to integrate information literacy skills into departmental programs and design courseware.

Fascinatingly, the movement to embed information literacy into the curriculum has become part of a new curricular paradigm called the Melbourne Model (University of Melbourne, 2004).
Melbourne, 2006). The Melbourne Model emphasizes “transferable and interdisciplinary skills, including critical thinking” that reach across disciplines (University of Melbourne, 2006). Seeking to give students both depth and breadth in their education, the goal of the Melbourne Model is to create lifelong learners.

It’s interesting to note that in 2003 when the LRS information literacy program was reviewed, faculty had only a vague understanding of the concepts that guided the information specialists’ mission (Bridgland & Whitehead, 2005). Now these concepts are at the core of the university’s philosophy. At the end of their article, Bridgland and Whitehead (2005) note that “integration of information literacy at course and program level is only possible if we are able to create thriving communities of information literacy practice in our universities” (p. 59). Evidently, they succeeded.

California Polytechnic State University, San Luis Obispo

In 2003, the librarians at the Robert E. Kennedy Library at the California Polytechnic State University at San Luis Obispo (Cal Poly) began an ambitious plan. Using systems thinking methodology, they set about reassessing their traditional roles and began moving from a service orientation to a learning and teaching outlook (Somerville, Schader & Huston, 2005). To implement this holistic approach they chose a change management system called Soft Systems Methodology (SSM). Developed by Peter Checkland and his colleagues at the University of Lancaster in England, SSM is extremely useful in complex situations where even deciding what the problem is can be controversial. Very briefly, SSM is a learning cycle. Participants create possible models of how to approach a problematic situation. These models are used to question the situation, which leads “to new knowledge and insights concerning the problem situation...leading to further ideas for relevant models” (Checkland, 2000, p. S15). Eventually an optimal model is designed and applied.

The challenge facing Cal Poly librarians was the need to reinvent the library’s organizational structure, its service priorities and staff assignments—a very tall order (Somerville, Schader & Huston, 2005). A characteristic of SSM that was instrumental in initiating change was a “[focus] on interdependencies, where x influences y, y influences z, and z influences x” (Davis & Somerville, 2006, p. 129). Because this type of systems thinking is
“circular rather than linear,” the search for solutions was able to cross normal departmental and divisional boundaries (Davis & Somerville, 2006, p. 129).

Indeed, the librarians’ problem-solving models moved them “well beyond the safe confines of the reference desk” (Somerville, Schader & Huston, 2005, p. 218). Quite literally, because one of the organizational decisions reached was to have paraprofessionals staff the reference desks rather than librarians. This freed librarians to review “course syllabi, program reviews, curriculum plans, and accreditation standards which guide faculty assignment development decisions” (Somerville, Schader & Huston, 2005, p. 218).

These new roles were important to the information literacy model Cal Poly was moving toward. While the library used SSM to achieve its goal, it also used the Australian and New Zealand Institute for Information Literacy (ANZIIL) standards to frame its objectives. Slightly different from the ACRL standards for information literacy, the ANZIL standards place information literacy skills within a continuum which “ideally advance concurrently with disciplinary competence” (Somerville, Schader & Huston, 2005, p. 216). This is the same ideal of embedded information literacy to which SJSU aspires.

Cal Poly librarians now provide the following services to faculty (Davis & Somerville, 2006, pp. 134-135):

- Review of course assignments and syllabi with academic faculty to explore possibilities for leveraging new information resources and finding aids to reconstruct assignments;
- Review of academic departments’ mission and vision, curriculum plans, external reviews, and accreditation standards, complemented by ongoing conversations with academic department liaisons to ensure collection development profile currency;
- Pairing of disciplinary information resources and research competencies with curriculum integration strategies which successfully advance information, communication, and technology proficiencies among students and faculty; and
- Dialogue with college faculty members to embed information competence proficiencies and information resource content into revised course syllabi and departmental curriculum plans.
Like Cal Poly, SJSU is working on a curricular transformation. By using systems thinking as was done at Cal Poly, librarians at SJSU would be able to see the university for what it is: a complex organism affected by factors within and without (Somerville and Mirjimadotter, 2005). Seen as an interlocking and interdependent system, the SJSU campus can only benefit from having an involved and vibrant library at its heart.

**Florida International University**

One of 11 campuses in Florida’s state university system, Florida International University (FIU) is located in the Miami area and has an enrollment of more than 38,000 students (FIU, 2006). Like the CSU system, FIU was a pioneer in information literacy education.

FIU first began developing an information literacy program model in 1996 (Iannuzzi, 1996, The Library Instruction Program). The first component of the plan is the Library Certification Program. Students in the campus’s mandatory freshmen composition classes come to the library for two courses: Critical Thinking in the Information Age and Research Strategies. Completion of a web-based tutorial is also required.

“Building upon our success with the Library Certification Program,” writes Patricia Iannuzzi, “we … expanded the program into the core curriculum, working with specific departments and programs to build in required sequences of classes linked to core classes for upper division students” (1996, The Library Instruction Program). Although librarians still offer in-class, course-related instruction, they view requests as the “beginning of a negotiation process with the department to develop a more formal sequence of instruction for that discipline” (Iannuzzi, 1996, The Library Instruction Program). Starting with the department chair, they collaborate with each department to embed an information literacy component into its program of courses. They do this by helping faculty create assignments and determine course objectives and outcomes. Iannuzzi notes that approaches to teaching information literacy differ across disciplines: “Programs vary from as little as one required class for psychology majors, to an eight class sequence for engineering majors” (1996, The Library Instruction Program).

Aiding the library’s push to embed information literacy into the FIU curriculum is its partnership with the campus’s Academy for the Art of Teaching (Iannuzzi, 1998). The mission of the Academy is to help faculty bring critical thinking skills into their classrooms. Together, the
library and the Academy form the Information Literacy Initiative, which guides the growth of FIU’s information literacy program.

The Information Literacy Initiative targeted four popular campus initiatives (Iannuzzi, 1998, p. 101):

- Campus accreditation
- The FIU strategic plan
- Student retention
- Technology in the classroom

By piggybacking on to these projects—participating in accreditation committees and at strategic planning meetings, for instance—the library was better able to promote its information literacy agenda. By “inverting their thinking” and seeing how information literacy could be introduced into existing campus movements, librarians were able to advance their goals on a variety of fronts (Iannuzzi, 1998, p. 101).

This backdoor tactic of promoting information literacy is strategically interesting. By riding the coattails of programs that already have strong faculty and administrative support, the library is given a chance to demonstrate how information literacy skills can support the goals of these popular initiatives. This in turn gives them another way to open a dialogue with departments that may be dragging their feet. This approach still requires a strong political presence on the part of the librarians, but offers an intriguing alternative method to advancing an information literacy agenda.

Iowa State University

With an enrollment of 26,000 students, Iowa State University (ISU) is similar in size to SJSU (ISU, 2007). And like SJSU, ISU also saw the importance of information literacy instruction. But rather than limit itself, ISU sought to create a program that embedded communication and technological competence in the curriculum as well (Lindstrom & Shonrock, 2006). Titled ISUComm, this program takes the concept of writing across the curriculum—in which writing is integrated into all subjects—and expands it to include not only written but also oral, visual and electronic communication, or WOVE. Initiated in 2001, the WOVE program was designed by a committee of faculty representatives and three librarians. “The impetus to include information literacy [in WOVE] came from the tenets of the Instruction Commons, an
information-literacy program already being used at ISU,” write Lindstrom and Shonrock in their 2006 article on the program (p. 22).

Established in 1999, the Instruction Commons is a web-based information literacy program that offers research resources for specific courses (ISU, 2006, Instruction Commons). The Instruction Commons “serves as both an information literacy program and a virtual space in which students, librarians, and members of the teaching faculty explore ways of integrating electronic resources and library research instruction into teaching and learning” (ISU, 2006, Instruction Commons).

Unfortunately, although information literacy standards are included in the WOVE objectives, librarians no longer have a direct involvement with the WOVE curriculum (Lindstrom & Shonrock, 2006). As at SJSU, they are limited to in-class information literacy lectures and then only when invited by the professor. When asked, they also continue to collaborate with faculty in the Instruction Commons.

At ISU, information literacy trails rather than leads a campus effort to create a curriculum that develops students’ communication skills across all disciplines. The proficiencies of an information literate person are seen as important, but they take a backseat to the broader program designed to strengthen students’ communication abilities. ISU has been included in this report as an object lesson about the need for political stamina in establishing the library’s position within the campus community. As Edward Owusu-Ansah (2004) writes, “Academic leaders in the course of engaging librarians and subject faculty in the search for solutions, frequently try to please both by encouraging librarians to try what they can while avoiding the potential wrath of subject faculty by refusing to delineate or mandate any new requirements” (p. 3). In situations like this, librarians must muster all their political will in order to continue to have a voice in how the campus curriculum evolves.

Transfer Students

When designing an information literacy program, it’s important to consider all categories of students. At SJSU, the segment of the student body that presents the most challenge is transfer students. When students enroll at SJSU midway through their academic career, there is no assurance that they have had the proper information literacy training they need to succeed in the university’s upper-division courses. This is because almost all of SJSU’s transfer students come
from California community colleges, which have a spotty record of providing information literacy instruction (Hellenius, 2006). Without this very necessary knowledge, transfer students too frequently flounder and fail. So what is the best way to give them the competencies they need?

Campuses have used two techniques to retain and help these students: workshops and online tutorials. At Florida International University, transfer students have a choice of both: an in-person workshop or an online, self-paced information literacy tutorial (FIU, 2000). The University of Wisconsin at Parkside provides only one option. It requires all students entering the university with fewer than 90 credits to complete a five-module information literacy tutorial online (UW-Parkside, 2004).

Due to the diverse academic backgrounds of transfer students, a rigorous online tutorial promises to be the best vehicle to deliver the training they need. Those with previous information literacy instruction will breeze through; those without will get to learn and practice the skills they need. But whether information literacy is taught online or in-person, making the instruction mandatory is crucial. In this way, transfer students and continuing students can meet on a level playing field, and all students graduate with vital lifelong learning skills.

Collaboration

Information literacy education is not possible without partnerships…all need an awareness of the value of information literacy, and all need to collaborate to make possible learning experiences that facilitate information literacy. (Bruce, 2004, Partnerships between key personnel)

As illustrated by the preceding case studies, collaboration is vital to the success of any information literacy program. “Well-documented in the literature is the sentiment that for a campus-wide [information literacy] initiative to be successful and enduring, true collaboration, although elusive and difficult to achieve, is an inescapable necessity” (Shane, 2004, p. 93). To succeed, librarians must collaborate with administrators (top-down) as well as faculty (bottom-up) (Shane, 2004). And to ensure the sustainability of information literacy programs, creating campus partnerships with other academic departments is also essential.
In the ACRL’s list of best practices, the ideal expressed for collaboration is that it “takes place at the planning stages, delivery, assessment of student learning, and evaluation and refinement of the program” (2007a, Category 6). In short, librarians should be collaborating throughout the entire process of creating and delivering the information literacy curriculum.

In the most successful embedded information literacy programs, such as the University of Melbourne, the university administration is in the picture from the beginning. While “location, location, location” may be the guiding principle in real estate, for collaboration it’s “meetings, meetings, meetings.” By attending strategic planning meetings, connecting with key administrative personnel, reading reports, visiting web sites, and reviewing meeting minutes, librarians can become a vital part of campus decision-making. Persuading university officials to see the big information literacy picture demands that librarians participate in any and all campus-wide movements—consistently and frequently.

As important as it is to develop a relationship with the university administration, developing campus partnerships is also crucial to the sustainability of information literacy efforts. At SJSU, the outreach librarian already offers information literacy workshops through the Center for Faculty Development. The library also works with the Academic Success Center to offer reference services to students. In addition to these current outreach efforts, other units of the Department of Academic Technology—such as Web Services and Media Services—could be cultivated as candidates for collaboration. At the University at Albany, State University of New York (UAlbany), campus partnerships have yielded programs that include “the effective use of the library’s resources in designing research assignments; the research process for new teaching assistants; evaluation of information resources, including Web-based resources; and instructional technology” (Mackey & Jacobson, 2005, p. 142).

Probably the most crucial and delicate collaborative relationship facing librarians is working with individual academic departments and faculty. In his article “Department-Integrated Information Literacy: A Middle Ground,” William Joseph Thomas (2005) outlines the key steps to successful collaboration (p. 39):

- Select an entry point
- Map information literacy goals onto the department’s goals
- Work with departmental faculty to plan
- Draft assessment measures
• Support the students

By “entry point” the author means any factor that might spur a relationship between faculty and librarians, such as faculty concerns about plagiarism or programmatic accreditation requirements for information literacy (Thomas, 2005). Obviously, this process is not quick and is likely to be cyclical, requiring review on a regular basis and a refining of the process in response to student and faculty feedback.

At the University of Rhode Island—one of the case studies discussed above—the library takes the collaborative tack of focusing on faculty needs (URI, 2005). By “selling” information literacy as a means to improve both teaching and research and making it convenient for faculty to learn about the subject, URI helped speed its integration into the curriculum. The library offers faculty the following services (URI, 2005):

• New faculty orientation to introduce the library’s information literacy program.
• Workshops for all faculty to introduce new library materials and services.
• Consultations with other teaching faculty to develop models of collaborative instruction where information literacy skills can be built into the curriculum.
• Promotion of currently existing library services and expertise to facilitate the research process.

As illustrated by the URI example, an essential part of collaboration is marketing. Tailoring information literacy to specific disciplines and illustrating customized instructional plans can go a long way to establishing connections with faculty (Shane, 2004). By becoming discipline-specific, librarians start speaking the same language as faculty.

At UAlbany, collaboration took the form of teaching alliances (Mackey & Jacobson, 2005). Creating a teaching alliance begins “either in the planning stages for a course, in the classroom, or in working with a particular library collection” (Mackey & Jacobson, 2005, p. 141). Librarians help instructors by suggesting assignments that strengthen students’ information literacy skills and highlight research tools that could be incorporated into lessons. Librarians are also available for team teaching courses. Reference librarians provide guidance to special collections, such as rare books or digital image archives, which can then be integrated into class assignments and offer another level of enrichment to student learning (Mackey & Jacobson, 2005).
In all their collaborative efforts with faculty, SJSU librarians must stay aware of the very important intangibles involved in any cooperative relationship. “Collaboration … is contingent upon outreach. Librarians must reach out and teach faculty, not just students. *They must be respectful of pressures on faculty* [italics added]” (Stevens, 2007, p. 256).

Ruth Ivey (2003) provides an excellent short list of the behaviors necessary for successful collaboration (p. 102):

- A shared, understood goal
- Mutual respect, tolerance, and trust
- Competence for the task at hand by each of the partners, and
- Ongoing communication

By having a common purpose, regard for the partners involved, and a continuing conversation, SJSU can aspire to the ultimate collaborative goal presented by SJSU associate dean Mary Somerville in her presentation to the 2007 WASC Annual Meeting on April 20, 2007 (see Figure 2 below). Not simply a faculty-librarian or librarian-administration collaboration, this model seeks to unite the whole campus.
Staff Development in the Library

Technological innovation is changing how students are taught and how information is accessed at a staggering rate of speed, and to master these new technologies demands that librarians practice the lifelong learning skills that they teach. In addition, librarians also need to learn instructional design techniques in order to effectively train faculty in how to incorporate information literacy into existing courses.

Ideally, the ultimate achievement of training at SJSU would be a “blended librarian” (Shank, 2006). A blended librarian is defined as “an academic librarian who combines the traditional skill set of librarianship with the information technologist's hardware/software skills, and the instructional or educational designer's ability to apply technology appropriately in the teaching-learning process” (Shank, 2006, p. 515).
In a movement toward this goal, the library has offered its staff an online technology education program called Learning 2.0. Developed by Helen Blowers, technology director of the Public Library of Charlotte and Mecklenburg County in North Carolina, Learning 2.0 helps participants become familiar with “blogging, RSS news feeds, tagging, wikis, podcasting, online applications, and video and image hosting sites” (Learning 2.0, n.d.). A workshop on designing learning objectives was also made available to library staff this year.

Although the tutorial and workshop provide a good beginning, librarians at the King Library would benefit from a more comprehensive staff development program. This is especially important in the area of instructional design, a subject that will become an increasingly large part of the librarians’ jobs as the library transitions to an embedded information literacy model. An excellent example of a solid training program is provided by the University of New South Wales (UNSW) in Australia. As part of its quest to create blended librarians, the campus offers a staff development curriculum that is designed to provide librarians with both technological and teaching skills. The modules include (Thompson, 2002, p. 231):

1. Adult learning and development
2. Human memory
3. Communication and experiential learning
4. Evaluation
5. Instructional design
6. Instructional technology

UNSW also created a web-based program called TSISL (Teaching Skills for Information Skills Librarians) as an alternate training tool (Barrett & Trahn, 1999).

An alternative to an in-house training program such as that offered by UNSW are the workshops available from the ACRL (ACRL, 2007b). Called Immersion Programs, they offer both a teacher track and a program track. Lasting five days, the teacher track covers “classroom techniques, learning theory, leadership, and assessment framed in the context of information literacy,” and the program track educates librarians on “developing, integrating, and managing institutional and programmatic information literacy programs” (ACRL, 2007b). The ACRL also offers an Intentional Teacher Program, a three-and-a-half day course designed to refine librarians’ teaching skills (ACRL, 2007b). Unfortunately, the cost for these courses averages from $1,300-$1,500 per person, exclusive of travel costs. It’s also doubtful that librarians would
learn everything they need to know in such short, intensive courses. As Elaine Z. Jennerich of the University of Washington Libraries notes, “Patience, persistence and repetition … are the keys to engendering change and unlocking the potential within library staff members” (2006, p. 614).

A more cost-effective solution might be a partnership with SJSU’s own College of Education. Using as a template the topics covered in the UNSW program, faculty from the college could speak to the librarians’ specific learning requirements and a program could be designed around the campus’s particular needs.

Another option would be to expand on the concept of online learning that began with Learning 2.0 by adapting a web-based course that focuses on college instruction. SJSU’s Center for Faculty Development web page offers a link to just such a tutorial called Orientation to College Teaching. This tutorial is a web-based series of modules designed by the Center for the Enhancement of Teaching at San Francisco State University and covers such topics as learning objectives, developing learning activities and assessment (SJSU, n.d.).

However it is delivered, a strong staff development program in the university library provides long-term benefits for the whole campus. As Elaine Z. Jennerich (2006) writes, augmenting librarians’ skills (pp. 613-614):

- Enhances the new staff experience
- Improves external and internal customer service
- Increases expectations/decreases anxiety
- Improves group communication skills
- Gives tools for tackling problems creatively
- Makes library staff valuable to the campus
- Invigorates the need for personal improvement
- Instills confidence throughout the organization

Obviously, staff development in the library promises advantages to the whole university. But it also benefits employees individually by unlocking their potential. This sense of empowerment leads to increased job satisfaction and a positive organizational culture (Jennerich, 2006).
Embedded Information Literacy Program Models

“While an integrated curricular approach to information literacy is described as a best practice, we must realize that the world of teaching and training is also changing” (Virkus, 2003, p. 100). This quote cuts to the heart of teaching information literacy today. It is not only what is being taught that is changing, but how it is being taught is also in transition.

The Internet has made the structure of many class assignments increasingly irrelevant, and part of rethinking the curriculum is turning away from the reserves-lecture-textbook approach that shapes so many college courses (Breivik & Gee, 2006). This traditional method of teaching with its predetermined sources of information doesn’t allow students to acquire the research skills they need to navigate the flood of information released by the digital age.

Another consideration is creating course structures and assignments that appeal to all types of learning styles—visual, auditory and kinesthetic (see Table 2). While lectures might appeal to auditory learners, kinesthetic learners will be left out in the cold. And while PowerPoint slides and a heavy load of reading might delight visual learners, auditory learners will be left struggling. Finding a balance that makes learning accessible to all students is a challenge.

Today, a well-structured assignment (Breivik & Gee, 2006, p. 51-52):

- Imitates reality
- Is active
- Is individualized
- Accommodates constantly changing information

An examination of the ACRL recommendations for best practices in pedagogy provides additional guidelines: use diverse approaches to teaching that are responsive to all learning styles and provide real-life, problem-solving activities that lead to active, collaborative learning (2007a, Category 7). But in practice, how exactly are these strategies applied? The following sections will discuss how universities are bringing these recommendations to life when teaching information literacy in the classroom.
Table 2
Learning Styles
(adapted from University of South Dakota, n.d., Three different learning styles)

<table>
<thead>
<tr>
<th>Visual Learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>- take numerous detailed notes</td>
</tr>
<tr>
<td>- tend to sit in the front</td>
</tr>
<tr>
<td>- are usually neat and clean</td>
</tr>
<tr>
<td>- often close their eyes to visualize or remember something</td>
</tr>
<tr>
<td>- find something to watch if they are bored</td>
</tr>
<tr>
<td>- like to see what they are learning</td>
</tr>
<tr>
<td>- benefit from illustrations and presentations that use color</td>
</tr>
<tr>
<td>- are attracted to written or spoken language rich in imagery</td>
</tr>
<tr>
<td>- prefer stimuli to be isolated from auditory and kinesthetic distraction</td>
</tr>
<tr>
<td>- find passive surroundings ideal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Auditory Learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>- sit where they can hear but needn't pay attention to what is happening in front</td>
</tr>
<tr>
<td>- may not coordinate colors or clothes, but can explain why they are wearing what they are wearing and why</td>
</tr>
<tr>
<td>- hum or talk to themselves or others when bored</td>
</tr>
<tr>
<td>- acquire knowledge by reading aloud</td>
</tr>
<tr>
<td>- remember by verbalizing lessons to themselves (if they don't they have difficulty reading maps or diagrams or handling conceptual assignments like mathematics).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kinesthetic Learners</th>
</tr>
</thead>
<tbody>
<tr>
<td>- need to be active and take frequent breaks</td>
</tr>
<tr>
<td>- speak with their hands and with gestures</td>
</tr>
<tr>
<td>- remember what was done, but have difficulty recalling what was said or seen</td>
</tr>
<tr>
<td>- find reasons to tinker or move when bored</td>
</tr>
<tr>
<td>- rely on what they can directly experience or perform</td>
</tr>
<tr>
<td>- activities such as cooking, construction, engineering and art help them perceive and learn</td>
</tr>
<tr>
<td>- enjoy field trips and tasks that involve manipulating materials</td>
</tr>
<tr>
<td>- sit near the door or someplace else where they can easily get up and move around</td>
</tr>
<tr>
<td>- are uncomfortable in classrooms where they lack opportunities for hands-on experience</td>
</tr>
<tr>
<td>- communicate by touching and appreciate physically expressed encouragement, such as a pat on the back</td>
</tr>
</tbody>
</table>
Information Literacy Instruction for Students

Active Learning

Research-based learning, problem-based learning, inquiry-based learning, discovery learning—these are all active learning techniques that help students become involved in their own education (Hook, Atkinson & Nicholson, 2007). Active learning helps students become dynamic learners because “it situates learning in real-world problems and makes students responsible for their learning” (Hmelo-Silver, 2004). It is also a pedagogical technique frequently—and successfully—used to teach information literacy.

At the University of Notre Dame, active learning activities were incorporated into a Chemical Information Research Skills course (Smith, 2007). Copyright concepts were reinforced with a specialized tic-tac-toe game. Boolean operator terms were taught using crossword puzzles. Students searched on their own names—“vanity searching”—to practice their newly learned research techniques. Lectures were broken up by having a library tour halfway through class, rather than at the beginning or end of class as had been traditionally done. “The key,” Smith writes, “is to think EDU-tainment as opposed to ENTER-tainment” (2007, p. 283). Active learning automatically provides this distinction because learning objectives are integral to every exercise and game used.

One active learning technique, problem-based learning (PBL), is especially effective for teaching information literacy. Following is a discussion of PBL, its applications and possible drawbacks as it is applied to information literacy instruction.

Problem-Based Learning (PBL)

Problem-based learning (PBL) began in 1969 at the medical school at McMaster University in Ontario, Canada (Macklin & Forsmire, 2004). It arose in medical schools in response to the wave of information that had started becoming available to medical students and made “mastery” of medicine impossible. Today, proficient doctors must be trained to be lifelong learners (Spence, 2004).

PBL is implemented in medical schools this way: a realistic health problem is assigned to students; teams of students guided by a tutor attempt a diagnosis and discover what information they’re lacking; students individually research to discover the answers; the students and their
tutor try another diagnosis; and the cycle is repeated until the most likely diagnosis is achieved (see Figure 3) (Spence, 2004). The problems assigned are purposefully “messy.” Like real life, they do not lend themselves to simple, black-and-white answers but require interpretation and research.

Figure 3
The Problem-based Learning Cycle
(adapted from Figure 1, Hmelo-Silver, 2004, Problem-based learning: What and how to students learn?, P. 237)

In this mode of learning, the traditional roles of the student and teacher are transformed (Hmelo-Silver, 2004). Rather than handing down wisdom from the lectern, instructors become coaches and guides. Faculty is responsible for modeling good learning strategies rather than just being content experts. And the initiative for learning is handed over to the students, who must become “reflective and self-directed learners” (Hmelo-Silver, 2004, p. 239). Obviously, research and evaluation skills—information literacy—are key to PBL (Spence, 2004).
Since its inception, PBL has crossed over from medical schools and is now applied in the broader curriculum. For information literacy training especially, a research-based learning technique such as PBL is ideal. At Purdue University, for instance, information literacy instruction using PBL was incorporated into the curriculum (Macklin & Forsmire, 2004). The program at Purdue was piloted in two courses: Earth and Atmospheric Science, and Science and Society.

Instructors had students start their problem-solving with a web search, a technique that students knew and were comfortable with. Although the topic was a very popular one—global warming—a search of the web didn’t solve the problem they’d been given. It was only after the inadequacies of the web search were revealed that the instructors introduced databases and instructed the students in how to use them (Macklin & Forsmire, 2004). By taking this approach, the instructors achieved two goals. First, they effectively overcame the common student resistance to information literacy, which is there is nothing they need to learn when it comes to finding information (Julien, 2005; Macklin & Forsmire, 2004). Second, after overcoming this attitudinal barrier, they were than able to teach students valuable research skills.

With PBL, “librarians can design several different activities to appeal to multiple learning styles. Varying lecture with hands-on practice and allowing for both individual, guided practice, and group work appeal to different learning styles, potentially maximizing the impact of the session” (Willis & Thomas, 2006, p. 437). As illustrated in the Purdue University example, group work especially is very common in active learning techniques such as PBL. But the instructional technique of working in groups has its critics. Many students—and professors—remember group projects of old where half the group did the work, the other half slid but everyone shared a grade. A refinement of the group work that avoids these problems is used in PBL is called cooperative learning.

Another component of active learning, cooperative learning is distinguished by several factors. Among these are positive interdependence; individual accountability; and heterogeneous group membership (Johnson, Johnson & Holubec, as cited in Ransdell, 2005, Cooperative Learning). In group work, these principles are put into practice by giving each member a necessary role; grading members separately, not as a group; and ensuring that groups are mixed by gender, race and ethnicity. The problems posed in PBL coursework can be complex and
working in groups is an asset. By incorporating these cooperative learning principles, students reap the benefits of group work and avoid the drawbacks.

By using cooperative learning and PBL techniques in the classroom, instructors are demonstrating several ambitions for their students. They want students to (Barrow and Kelson cited in Hmelo-Silver, 2004, p. 240):

1. Construct an extensive and flexible knowledge base;
2. Develop effective problem-solving skills;
3. Develop self-directed, lifelong learning skills;
4. Become effective collaborators; and
5. Become intrinsically motivated to learn.

These are ambitious goals for a teaching technique and put a lot of pressure on instructors as well as students. A great deal of pedagogical skill is required to successfully manage a course using PBL—one professor attempting to facilitate a class of 20 students would find PBL very challenging to implement successfully (Hmelo-Silver, 2004). Some universities have tried to solve this problem by employing graduate students to act as co-facilitators or by increasing the size of the collaborating groups (Moust, van Berkel & Schmidt, 2005). But even with these fixes, PBL is a technique that obviously requires work. Is it worth it?

Research has shown that only “5 percent of lecture material is retained as opposed to 50 percent for group discussions” (Smith, 2007, p. 277). This is especially true for the Millennial Generation, students aged 17 to 19 years old. Students simply learn better when they learn by doing, and for teaching information literacy the investigative nature of PBL seems a tailor-made solution (Hmelo-Silver, 2004; Smith, 2007). In addition, PBL requires self-directed learning, a skill that prepares students to be lifelong learners, the ultimate goal of information literacy instruction (Hmelo-Silver, 2004). With all these attendant benefits, PBL certainly seems worth the effort involved.

**Interactive Lectures**

Despite the strengths of PBL, there is an excellent chance that there will be faculty members who do not want to give up their lecture habit. One way to bridge the distance between the lecture and active learning methodologies is the interactive lecture presentation (Ransdell, 2005). “An interactive lecture is one in which the instructional focus continually shifts between
the instructor and the students at fairly regular intervals” (Ransdell, 2005, Interactive lectures). This is done by allowing students to write, discuss or do some type of hands-on activity after a short lecture. Techniques like these “keep students focused, attentive, and learning” (Ransdell, 2005, Interactive lectures).

The feedback lecture, developed at Oregon State University in 1974, is a particular variety of interactive lecture designed to connect with students of every learning style (Ogden, 2003). To begin, a study guide is provided to students prior to class and focuses student attention on the main concepts to be covered. On the day of the class, short lectures (20 minutes or less) are followed by discussion sessions with two to three students in each group. With its variety of formats—reading, lecture and discussion—the feedback lecture “enables students to learn by their own strengths while providing ample opportunity for developing related strengths in other areas” (Ogden, 2003, p. 25).

Overview of Active Learning

Active learning, particularly PBL, is a popular and effective pedagogical technique for teaching information literacy. When teamed with cooperative learning practices, many of the problems inherent in teamwork can be smoothed out. For faculty wanting a more familiar teaching technique, interactive lectures provide a bridge between the lectern and active learning. By employing these methodologies, SJSU can create a learning environment for information literacy “that fosters active, constructive, contextual, cooperative, and goal-directed learning” (Moust et al., 2005, p. 667).

Information Literacy Instruction for Faculty

At the University of South Carolina at Aiken (USCA), the library offered cash incentives to faculty in order to increase their participation in information literacy workshops (Little & Tuten, 2006). It’s doubtful the $25 they received would prove much of an inducement to faculty living in the pricey Bay Area, but this tactic is indicative of the difficulty librarians face in reaching instructors. Library-sponsored workshops often draw only a small number of the most motivated among the faculty (Adler, 2003; White, 2003). But unless faculty master information literacy skills themselves and learn how to incorporate them into their courses, student learning will suffer. So what is the best way to handle this dilemma?
Mackey and Jacobson (2005) suggest that attendance at workshops can be increased by highlighting the importance placed on information literacy by the campus accrediting agency and the campus administration. To spread this message, librarians should attend departmental meetings and campus-wide focus groups and promote the need for information literacy within the curriculum. In the CSU system, information literacy has a fairly high profile. So it now falls to the librarians at SJSU to continue the conversation with faculty and demonstrate in concrete ways how information literacy can be applied within their discipline.

In addition to discipline-specific approaches as a way to attract faculty, Patricia Iannuzzi of Florida International University suggests, “Individual faculty are influenced by the organizational energy on issues such as distance learning, technology in the classroom, and learning communities” (Iannuzzi, 1998, p. 100). That is, hitch the information literacy wagon to existing movements and programs and ride along. “[F]aculty are encouraged to revise their syllabi, teaching styles, and assessment methodologies, as they address these issues,” writes Iannuzzi, “Librarians have an opportunity to use information literacy to help faculty succeed in their own objectives” (1998, p. 100). This tactic reverses the question, so it’s not “how can faculty be used to advance information literacy,” but “how can information literacy advance faculty objectives?”

Claire McGuinness of the School of Information and Library Studies at University College Dublin in Ireland also offers several solutions to help faculty explore the “undiscovered country” of information literacy (2006, p. 580):

- Include information literacy in the professional development modules offered to faculty
- Target journals in the educational research arena for publication of articles on teaching information literacy
- Target educational conferences for the presentation of papers on information literacy
- Organize discipline-specific workshops, seminars and conferences on information literacy for faculty
- Promote information literacy at the institutional level, especially when it comes to rewarding faculty for their efforts in promoting information literacy in the curriculum.
In a word, what she is calling for is marketing. Librarians at Northwest Vista College in San Antonio, Texas saw the same need for promotion (Reeves et al., 2003). Like San Jose State, the faculty at Northwest Vista College included a large number of part-time faculty. These instructors taught only one or two courses, had no offices on campus and did not have college email addresses. To reach the college’s diverse and dispersed faculty, the campus librarians devised a three-pronged strategy: get librarians out of the library and into the community; facilitate communication between librarians and the rest of the academic community; and get the faculty into the library.

To achieve these aims, the librarians put on workshops instructing faculty on how to use the library’s large, multidisciplinary databases. They engaged in minor theatricals, donning gray wigs and glasses for their presentation at a major faculty meeting, in order to play humorously on librarian stereotypes. They visited faculty in their offices, attended departmental meetings, made themselves available for team teaching, and collaborated with faculty in creating pathfinders and online tutorials (Reeves et al., 2003, p. 67). By providing outreach in all these different ways, the librarians became very effective in marketing the library “brand.”

In addition to marketing, another overriding theme when working with faculty is choice. Mandatory workshops or other dictatorial directions intimate that faculty members are deficient in some way. This is unpleasant to anyone but especially unpleasant to those used to being in a position of power. Choice even in minor instructional elements—time, location, group composition—is important (White, 2003). Format, too, can be varied. Videos, podcasts and online tutorials are all possible vehicles for information literacy instruction.

When implemented well, faculty development efforts are successful in (Breivik & Gee, 2006, p. 58):

- Keeping faculty apprised of new information resources and services in their own fields of research;
- Familiarizing faculty with relevant resources and services beyond their areas of specialization;
- Familiarizing faculty and/or their assistants and secretaries with the time-saving tools and services of the library;
- Helping faculty understand the research capabilities and needs of their students;
• Working with faculty in developing learning experiences based on the use of books, magazines, newspapers, online and media resources; and
• Working with faculty in structuring experiences that will effectively promote the mastery of information literacy and other critical thinking skills.

Having drawn instructors in through marketing and provided choice and flexibility in delivering instruction, what’s the best way to go about teaching the teachers? Although USCA’s cash-up-front tactic is questionable, the workshops the librarians ran there are worthy of imitation. They had faculty research a topic outside of their discipline, so they could replicate the experience of beginning students and feel some of their frustration. After experiencing the aggravation brought about by the lack of information literacy skills, faculty were then taught more complex search strategies within their disciplines that they were unlikely to have learned on their own (Little & Tuten, 2006). In this way, the librarians demonstrated to faculty the value of teaching information literacy rather than leaving students to learn by trial and error.

At Oberlin College in Ohio, librarians have designed an extensive menu of faculty workshops on topics such as (Eisenberg, Lowe & Spitzer, 2004, p. 138-139):

• Information sources and search strategies
• Standard reference sources
• How catalogs and databases are organized
• Effective database searching
• Electronic indexes
• Lexis/Nexis and other full-text databases
• Tools for searching the Web
• Government documents
• Information literacy in the curriculum

In the workshops, librarians provide sample reference questions for hands-on exercises and use breakout sessions for small group discussions (Oberlin College, 1999, Tools and Techniques). And for faculty who are not able to attend, videotapes are made of each session and a website with links to all the course materials is maintained.

At James Madison University, faculty members have the opportunity to attend a three-day workshop entitled “Information Literacy for Teaching and Learning” (JMU, 2007). Topics covered include learning objectives; identifying student information literacy skills; plagiarism
Implementing an Embedded Information Literacy Program

and academic honesty; assignment design for large classes; assessment and rubrics; and how to teach research skills to students. Librarians use a combination of presentations and exercises “to design effective active learning assignments, plan instruction, develop an assessment strategy and test drive an assignment” (JMU, 2007, para. 1). Attendees are then encouraged to “showcase their results at a Center for Faculty Innovation program open to all JMU faculty” (JMU, 2007, Workshop introduction). With this format, librarians provide solutions to real-life faculty issues and then follow-up by providing an opportunity for public approval from the faculty members’ peers. Together, this is a very effective pedagogical strategy.

At Touro College in New York, the workshop “Information Literacy—Your Library and You” places an emphasis on the new technology the library offers (Touro College, 2007a, Faculty workshops). EReserves, NoodleTools and other Virtual Library utilities offered by the library are demystified. The workshop also offers hands-on exercises to show faculty how to incorporate information literacy skills into their assignments. For faculty not willing or able to attend, the library also offers an online tutorial. Titled “Creating and Evaluating Effective Library and Web Assignments,” it covers many of the same topics as the workshop in an impressively concise format (Touro College, 2007b). The tutorial is able to stay this brief by offering a variety of handy links throughout that allow faculty to explore in-depth the topics that interest them most. Flexibility and choice are key when providing information literacy education to faculty, and Touro College does a notable job on both accounts.

As illustrated by the examples above, the same active learning techniques that work so well with students are just as successful when teaching faculty. And librarians should also try to reach all learners among faculty as they do with students. Although in the case of faculty, the important distinction among learners is between those learners who like in-class instruction and those who prefer independent learning. By providing the choice as Touro College does, librarians increase the spread of their information literacy instruction.

Flexibility and choice are two intangibles important to faculty development, and author Gary Thompson (2002) offers a third, “In any approach to teaching faculty about information resources and about information literacy, librarians must respect that faculty are the experts in teaching in general as well as in their respective disciplines” (p. 235). He goes on to note the importance of give and take in any workshop or seminar presented by the library. So the final
important key to instructing faculty in information literacy is attitude. As in any human interaction, a little respect goes a long way.
Organizational Change

One observer of the academic scene noted that, “The progress of an educational institution is directly proportional to the death rate of its faculty” (Kempcke, 2002, p. 540). A mordant observation, but understandable. Universities are famed for their slow rate of change (Shane, 2004). As institutions composed of intelligent, opinionated people who are very ready to defend their autonomy, it’s understandable that attempts at transformation might be unwelcome, resisted or, in the worst cases, ignored. But today more than anytime in the past, universities must be ready to change and change quickly.

Worldwide, academics are being forced to adapt to a number of transformations in the arena of higher education (European Commission, as cited in Virkus, 2003, p. 101):

- The increased demand for [higher education] in a lifelong learning context
- The internationalization of education and research
- The need to develop cooperation between universities and industry
- The proliferation of places where knowledge is produced
- The reorganization of knowledge
- The emergence of new expectations

And without question, “libraries truly are one of the most rapidly changing departments on campus” (Breivik & Gee, 2006, p. 168). In 2004, Karen Holloway surveyed twelve libraries to discover how they approached organizational change. What she found was a wide variation in tactics:

Strategic planning was the starting point for a number of libraries. In several libraries process improvement was the impetus to change, and one library has a goal to undertake one process improvement project each year. Other libraries restructured by first eliminating layers of administration (but not the people in those positions) and/or establishing a team-based organization and then moving to strategic planning and process improvement. Another library has focused on improving internal communication as a first step, in tandem with strengthening delegation and decision-making. (p. 11)

Obviously, there are as many ways to manage change as there are libraries. In addition, as author Ken Kempcke (2002) notes, “Institutional administrators and scholars are coming to
realize that...organizational change must include not only changing structures and processes, but also changing the organizational culture as well” (p. 529). But what is the best way to approach change, especially the type of systemic change SJSU is contemplating? Following is a discussion of a number of specific change models that have been used with success by university libraries across the country. Also presented is an examination of how the current challenges within the SJSU organizational culture can be met.

**Balanced Scorecard**

The balanced scorecard is a change management technique that has been used by many academic libraries in the United States (Holloway, 2004). Developed in the 1990s by Robert Kaplan and David Norton, the balanced scorecard system uses a set of quantifiable measures that are established by an organization’s strategic plan. By using these predetermined benchmarks, change can be implemented then assessed (Holloway, 2004). When adapted specifically to nonprofits, the four key dimensions of the scorecard are: (1) employee learning and growth, (2) internal processes, (3) customer perspective, and (4) financial perspective (Holloway, 2004, p. 11).

One major proponent of the balanced scorecard approach is the University of Virginia (UVa) Library. The UVa Library first implemented the balanced scorecard in 2001 (Self, 2003). The Library had a long history of compiling data on its services—sometimes too much. The balanced scorecard had the effect of focusing attention on what really mattered. Like any major change, however, launching the balanced scorecard technique required support throughout the organization (Self, 2003). Task forces were assembled from all levels of staff and administration; their main job was to determine what to measure, which turned out to be the most controversial part of the project. This was because metrics are tied to values which are tied to the Library’s mission. So determining what to measure required real soul-searching on the part of the staff. But by involving all layers of staff in the very beginning, the library achieved their buy-in because employees were very much part of the process.

The UVa Library decided on a total of 26 metrics that fell within the four categories mentioned above (University of Virginia Library, 2007, Metrics):

- **User Perspective**: How well is the library meeting the needs of our users?
• **Internal Process Perspective**: How do the library's internal processes function to efficiently deliver library collections and services?

• **Finance Perspective**: How well are the library's finances managed to achieve our mission?

• **Learning/Growth Perspective**: How well is the library positioned to ensure that goals are met in the future?

For each metric, what was being measured and how success was to be determined was spelled out. Following is an example of a metric in the staff development area (University of Virginia Library, 2007, Metrics):

**Foster learning among its employees to encourage creativity, cooperation, and innovation**

**Metric L.1.a. Impact of Staff Development.**

**Target 1:** Positive scores (4 or 5) on 80% of responses to staff development statements in the biennial work-life survey.

**Target 2:** Positive scores (4 or 5) on 60% of responses to staff development statements in the biennial work-life survey.

**Method:** The University Library will conduct a work-life quality survey every other spring, alternating with the Internal Customer Service Survey. As part of the survey, each staff member will have the opportunity to rate his or her agreement with statements on different aspects of staff development and training on a 1 to 5 scale. The responses from staff development section will be tallied in aggregate.

Target 1 indicates complete success, and Target 2 indicates partial success (Self, 2003).

In 2006, almost 75% of the metrics reached Target 1 (University of Virginia Library, 2007, Metrics). To determine if they were achieving all of their benchmarks, the library collected data on: 1) customer satisfaction; 2) timeliness of service; 3) cost of service; 4) circulation; 5) funding success; 6) peer comparisons; and 7) internal improvements (Wood, Miller, & Knapp, 2007). At the heart of all these measures was the goal of continuous improvement (Wood et al., 2007). And judging from the results, UVa is doing well. But since continuous improvement is the objective, every year the library reexamines its metrics and asks two questions, “Does it improve the organization? Is it worth the effort?” (Self, 2003, p. 62).
An obvious benefit of the balanced scorecard approach to managing change is how it aligns goals and strategy. The specificity of the goals also makes it easy for all staff within the library to understand what needs to be achieved in order to succeed. Indeed, the library reports increased staff retention and higher morale as two of the major benefits of the balanced scorecard system (Wood et al., 2007).

Drawbacks to the balanced scorecard are equally obvious. This is not a low-maintenance system; to effectively implement the balanced scorecard approach requires continuous review and data collection. But despite its labor-intensive nature, the balanced scorecard remains a very popular choice among libraries considering organizational change (Holloway, 2004).

Learning Organization


- **Personal mastery**: the discipline of continually clarifying and deepening our personal vision, of focusing our energies, of developing patience, and of seeing reality objectively
- **Mental models**: the assumptions and generalizations that influence how one understands and interprets the organization
- **Shared vision**: helps members of the organization to understand the future its leaders want to create
- **Team learning**: teams become the fundamental learning unit of the organization
- **Systems thinking**: the ability to see the bigger picture, to see the interrelationships of a system, to move beyond a simple cause and effect approach to seeing continuous processes

The University of Nebraska—Lincoln Libraries (UNL) was one of the pioneers in implementing the learning organization ideals. UNL’s goal was to develop “employees who appreciate change, accept challenges, can develop new skills, and are committed to the organization’s mission, goals, and objectives” (Giesecke & McNeil, 2004, p. 55). How they did this is outlined in the article “Transitioning to the Learning Organization” by Joan Giesecke and Beth McNeil (2004):
UNL began its process by committing to change. Its vision statement was “seamless integration of print and electronic information in a flexible environment” (p. 62). Led by management, staff was encouraged to look at problems with a view to fixing them rather than saying how it couldn’t be done. The next steps were to promote learning as a way to improve how the library did business and assess how well the libraries were prepared to offer the training needed. All levels within UNL were polled; the skills staff would need were identified; and a list of core competencies was developed.

UNL management demonstrated its commitment to the learning organization ideals by enhancing staff development with classes and workshops. The topic of these courses was frequently new computer skills. Staff was also encouraged to share knowledge, and managers made sure to reward learning in tangible ways, such as tying salary increases to skill building.

Another way UNL demonstrated its commitment was to flatten the organizational structure, reducing the departments within the organization from seven to four. Also, a new classification system was developed, called NUValues. NUValues allowed staff to move about in the organization in a much more flexible way than in the previous rigid hierarchy.

Perhaps the largest adjustment was to organizational culture. Adapting, learning and improving were encouraged as cultural norms; the libraries came to be viewed as continual works in progress. The authors’ conclusion is that by “adopting the learning organization model…libraries can build paths for individuals that will lead to success and help libraries thrive in times of change” (p. 66).

In addition to UNL, the libraries at the University of Maryland and Georgia State University have embraced the learning organization as a change management model. With its emphasis on staff development and organizational culture, it’s easy to see the appeal this system has for libraries.

**Star Model**

In his 1995 book *Designing Organizations: An Executive Guide to Strategy, Structure, and Process*, Dr. Jay R. Galbraith presented what he termed the Star Model of organizational design (see Figure 4). The Star Model divides organizations into five policy areas and demonstrates how they interrelate and influence each other, like the five points of a star (Galbraith as cited in Wood et al., 2007, p. 39):
1. Strategy, which determines [the organization’s] direction
2. Structure, which determines the location of decision-making power
3. Processes, which have to do with the flow of information (they are the means of responding to information technologies)
4. Reward systems, which influence the motivation of people to perform and address organizational goals
5. People (human resource) policies, which influence and frequently define employees’ mind-sets and skills.

Figure 4
The Star Model
(adapted from Galbraith Management Consultants, 2004)

As explained by Karen Holloway (2004), Galbraith’s Star Model guides change management by focusing on these aspects within the categories of the model (p. 11):

1. Strategic planning, structure and roles of people in the organization;
2. Span of control (size and interaction of teams);
3. Work processes (communication, process mapping);
4. People and human resources policies, evaluation; and
5. Training and development.

The process of change at the University of Arizona Library and the University Library System (ULS) of the University of Pittsburgh reflect the Star Model’s approach to organizational transformation (Wood et al., 2007). As Galbraith notes, “The Star Model shows the levers that managers can control, and as a result, can affect employee behavior. By choosing the desired behavior, managers can influence the organization's performance as well as its culture” (Galbraith Management Consultants, 2004, The Star Model). By showing how to manage these two critical components of change—performance and culture—the Star Model offers a streamlined approach to organizational transformation.

Organizational Culture

In the Situation Analysis section of this report, the attitudes of faculty, librarians and students toward information literacy—and each other—were listed as potential roadblocks to implementing an embedded information literacy program at SJSU. Within any change model, the library needs to examine how to affect the attitude adjustments needed on campus.

Unremarkably, the largest factor in creating a positive organizational culture is respect. At Purdue University, librarians demonstrated respect when they launched their push to embed information literacy within the curriculum by asking faculty what skills were critical to success in their particular field (Macklin & Forsmire, 2004). This showed that they respected the faculty members’ expertise in their discipline. These skills were then organized to fit within the ACRL list of information literacy competencies. And because the faculty had written them, instead of having them force-fed by librarians or the administration, they were able to accept these benchmarks with enthusiasm (Macklin & Forsmire, 2004; McGuinness, 2006; White, 2003).

Demonstrating respect by giving faculty choice also worked well at the University of Albany. The UAlbany information literacy subcommittee, which is composed of both librarians and faculty, work together to offer instructors options on how they can deliver information literacy instruction (Mackey & Jacobson, 2005). Faculty can either include information literacy components in their existing courses or create brand-new courses shaped around information
literacy competencies. Offering faculty members choice in this way demonstrates respect for their skill and professionalism in the classroom.

A second factor that helps shape a positive organizational culture is extensive and ongoing communication. As George Bernard Shaw said, “The single biggest problem in communication is the illusion that it has taken place.” To replace the illusion with reality, it’s important to find the “optimal communication medium” for each group within the university that is involved with delivering information literacy instruction (Wood et al, 2007, p. 23). This might be email, a listserv, a wiki or a good old-fashioned flyer stuffed in a mailbox. It might be all of these techniques used in succession. But it’s important that each message that communicates a potential change in how business is done on campus contain two features: the benefits of the change to the recipients and a message customized to their particular concerns (Wood et al., 2007). Nothing destroys relationships faster than poor communication, so it’s crucial that this aspect of the library’s mission not be neglected.

To confront resistance to information literacy initiatives among faculty, students and librarians, a third factor to consider is education. As Jordana Shane notes, “Information Literacy can be the overarching, unifying cause drawing together what might seem like distinct concerns, such as: students’ technological fluency, issues of academic integrity, critical thinking, and skills involving the evaluation of information that has been retrieved from any number of different sources” (2004, p. 92). By demonstrating to faculty that information literacy is not just “a library thing,” to librarians that it’s not just a new name for bibliographic instruction, and to students that it’s not something they already know, all campus constituencies can be educated on the importance of lifelong learning skills. And this education can be achieved through the ongoing communication discussed above.

The final and most powerful factor is collaboration. As Julien and Given (2002) point out, “Faculty-librarian collaboration is one of the most prevalent solutions offered in the [library and information science] literature to the problem of faculty members’ disengagement from the [information literacy] imperative” (p. 70). By collaborating, librarians approach faculty as equal partners rather than as opponents in a turf war where there will be winners and losers, with the students always among the losers (Julien & Given, 2002). By educating faculty about the “unifying cause” that is information literacy, librarians can demonstrate that both parties are working toward the same goal.
Respect, communication, education and collaboration—by infusing the SJSU system with these attributes, the campus can create “a culture of teamwork for advancing well-informed, explicit, institutionally appropriate, and visionary plans for change” (Bennett, 2007, p.157).
Assessment

Program Assessment

But does it work? This is the question coming from accreditation agencies, campus administrators and faculty (Shane, 2004). It is not enough to simply establish an information literacy program; librarians also need to demonstrate that it is effective and that students are graduating with demonstrable lifelong learning skills. Currently at SJSU, the information literacy program is not objective focused. It needs both outcome measurements and assessment procedures (Somerville, personal communication, January 31, 2007). As is noted in the literature, too often librarians base decisions “on intuition, anecdotal evidence, and mental models of ‘how things should be’ or ‘how we desire them to be’” rather than on hard facts (Stoffle, Allen, Morden & Maloney, 2003, p. 368).

In a meta-analysis of information literacy articles published before 2005 that detailed student achievement, Denise Koufogiannakis and Natasha Wiebe (2006) had to sort through 4,356 relevant citations and winnow these down to a final group of 16 in order to find solid, scientific support for a hypothesis they were researching (p. 4). The enormous gap between the original 4,356 citations and the final sample of 16 illustrates the current weaknesses in assessing information literacy achievement. Frequently, only quasi-experimental techniques are used, making it hard to determine persuasive calculations, such as standardized mean differences (Koufogiannakis & Wiebe, 2006).

A second study confirms this state of information literacy assessment. In 2003, Alison Brettle of the University of Salford in England reviewed information literacy articles published between 1995 and 2002. She found that, although the articles reported a wide assortment of assessment methods—randomized controlled trials, experimental, quasi-experimental, cohort, observational, qualitative and, the favorite standby, questionnaires—“[m]any studies were flawed, either in their design, execution or reporting” (Brettle, 2003, p. 5).

The CSU system has been very proactive in its attempts to create a solid assessment tool for the information literacy programs on its various campuses, although its attempts, too, needed refinement. To put assessment efforts at SJSU into context, what follows is a discussion of the
history of assessment within the CSU system then a look at some of the information literacy program assessment tools available to libraries today.

**A History of Information Literacy Assessment at CSU**

In her article “Strengthening Connections between Information Literacy, General Education, and Assessment Efforts,” Ilene Rockman, a former manager of the CSU Information Competence Initiative, gives an excellent synopsis of the history of information literacy assessment within the CSU system (2002b, pp. 193-195):

Beginning in 2000, CSU used the expertise of the Social and Behavioral Research Institute at CSU San Marcos to create a multidimensional, multiyear qualitative and quantitative assessment for its students. The first phase was a telephone survey of 3,309 students from 21 campuses. Students were asked scenario-based questions that tested their problem-solving abilities, such as how would they find and evaluate medical information before a surgery. Results showed that freshmen underperformed older students due to their lack of skill with library resources.

Phase two began in 2001 and used qualitative methods to discover exactly what students do when searching for information. Random samples of lower- and upper-division students at four CSU campuses were assembled into focus groups and joined by librarians and faculty. These groups were given open-ended assignments and video, audio and screen-capture data was collected on their search techniques. Their findings reflect what often appears in the literature: students’ overreliance on web-based searches.

Also beginning in 2001, several CSU campuses and other campuses across the United States began working with the Educational Testing Service (ETS) on the creation of an Information and Communication Technology (ICT) Literacy Assessment (Somerville, Smith & Macklin, 2007). By 2003, early versions of the exam were being field tested, and in 2005, a beta version of the test was given to 4,580 students in 31 campuses across the country (Rockman & Smith, 2005). The culmination of this effort was iSkills™, an assessment instrument that in coming years will be used at SJSU and other CSU campuses. Following is a discussion of this newest assessment tool and two other established assessment instruments.
Efforts to assess information literacy have been evolving concurrently with efforts to teach it. In 2003, the nonprofit Educational Testing Service (ETS) published *Succeeding in the 21st Century* (ETS, 2003). This exploration of measuring and assessing information literacy proficiency, which was done in conjunction with several universities nationwide including the CSU system, evolved into the newly released iSkills™ assessment test (ETS, 2007).

SJSU was one of several campuses nationwide that worked with ETS to develop the iSkills™ test. With practical, scenario-based questions using common software applications—word processing, spreadsheets, and email—the test challenges students to use information efficiently and effectively (ETS, 2007). The test poses short problems (3 to 5 minutes) that measure a single information literacy proficiency, and also longer problems (about 15 minutes) that measure multiple proficiencies. Below is an example of a single-proficiency problem. Students are provided with an email program to work with and are given the following scenario (ETS, 2007, iSkills™ Online Tour):

**Scenario:** The office manager has emailed you, saying:

*Can you help me find a good source of products and gifts designed for left-handers? I’d like someplace that offers a wide range of merchandise with product guarantees—also that has an online catalog and online ordering. Discounts would also be a plus.*

You’ve received emails about three potential sources. Now you want to combine the information into a single table and rank the possibilities for your office manager.

**Task:** You need to

- Read the three emails in your inbox (some of which will have links to further information)
- Fill out the table provided, showing whether each source has the features of interest to the manager
When you have finished your table, click “Next.” You will then be asked to rank the potential sources from most preferable (1) to least preferable (3).

This question requires students to integrate information from three sources then draw conclusions from that data to reach an answer. With problems such as this, the iSkills™ assessment test answers the concerns of one educator who worried:

I think that the most you can really test is what your students have gathered at that moment from your class. … Testing the conceptual skills, as opposed to the practical skills, is a much harder thing. And in a way, that is the most important part. That's information literacy as opposed to being able to operate a database. (Cull, 2005, p. 14)

As Fiona Hunt and Jane Birks of Zayed University, United Arab Emirates, point out, “Assessment of student outcomes in information literacy is most effective if multiple measures are used. As opposed to the old model of ‘teach then test,’ information literacy is best assessed for both process and product” (2004, p. 33). The iSkills™ exam does this by testing seven proficiencies: define, access, manage, integrate, evaluate, create, and communicate (ETS, 2007, Overview). By using scenario-based rather than multiple-choice questions, it provides a much more realistic picture of students’ skills—both practical and conceptual—than earlier information literacy tests.

The iSkills™ test comes in two formats: the Core Academic Assessment and the Advanced Academic Assessment (ETS, 2007, Overview). The first is designed for incoming freshmen; the second is for students transitioning to upper-division work. At $22.00 a test, it will put a new demand on the university budget (ETS, 2007, Pricing). But the crucial need for graduates with information literacy skills demands that the university discover how well or how poorly its information literacy program is performing.

In addition to assessing the performance of the campus’s program, the test can also be used to:

Provide aggregated information about the performance of various groups, including entry-level students at two- and four-year schools, rising juniors, students seeking to enter majors that require ICT proficiency, students transferring from community colleges to four-year schools, students leaving college for the workforce, and displaced workers
seeking to gain the ICT skills required to rejoin the workforce. (Somerville, Smith & Macklin, 2007)

In this way, campuses can assess the information literacy deficiencies within specific groups and move to address them. For example, at Purdue University—another of the beta test sites for iSkills™—90% of the students rated themselves as highly skilled users of information technologies (Somerville, Smith & Macklin, 2007). These same students took the iSkills™ test, and 52% scored lower than half of the population that had taken the exam.

At SJSU, library administrators have discussed integrating the iSkills™ test with other assessment tests—the English Placement Test and the Entry Level Math Test —given incoming freshmen (Somerville, personal communication, May 29, 2007). They will be piloting the test in coming semesters and in two years time expect to require it of all incoming freshmen.

**Standardized Assessment of Information Literacy Skills (SAILS)**

Because of its history with the design, creation and beta testing of iSkills™, it is fairly assured that this is the assessment test SJSU will be employing. However, there are a couple of other assessments that have also been used with some success in the United States. One of these is SAILS.

Begun in 2001 at Kent State University in Ohio, SAILS aimed “to measure information literacy skills, gather national data, provide norms, and compare information literacy measures with other indicators of student achievement” (Kent State University, 2007, History). Since that time, more than 80 colleges and universities have used the Project SAILS web-based assessment exam. The test is composed of 45 multiple-choice questions, and it takes students an average of 35 minutes to finish (Kent State University, 2007, About the General Test). The exam is completed on the SAILS website and results from the test are organized using the ACRL framework of standards.

Although obviously less sophisticated than the iSkills™ test, one major advantage SAILS holds over iSkills™ is that it costs only $3.00 per student (Kent State University, 2007, Brochure). It also has proven reliability and validity, and can be easily completed in a single class period (Kent State University, 2007, Advantages). If budgets are squeezed and cost becomes a major consideration at SJSU, SAILS would provide a solid alternative to iSkills™.
Implementing an Embedded Information Literacy Program

Information Literacy Test (ILT)

A computerized, multiple-choice test developed by James Madison University (JMU) in Virginia, ILT is designed to measure student mastery of ACRL Standards 1, 2, 3 and 5 (JMU, 2006). The tests are priced at $7.00 each and the testing is administered by the Center for Assessment and Research Studies at JMU. With a total of 60 questions, the test can be easily administered in a single class period, but like SAILS is not as sophisticated as the iSkills™ exam.

Program Assessment Overview

In addition to the tests mentioned above, other assessment tools include the Bay Area Community Colleges Information Competency Assessment Project and the International Computer Driver’s License (Rockman & Smith, 2005). As well as satisfying accreditation criteria, data from all of the tests mentioned here can help faculty and librarians assess student proficiencies and refine the information literacy curriculum. In this way, the information literacy program at SJSU can be continually improved.

Learning Outcomes Assessment

Gauging students’ information literacy abilities on a programmatic level with assessment tests such as iSkills™ is important. The results will allow SJSU to establish benchmarks and determine the performance of their overall information literacy program. Equally important, however, are learning outcomes assessments for individual courses. Learning outcomes assessments asks the question, “What did students learn, and how is it known they learned it?” (Dugan & Hernon, 2002, p. 379). Answering this question helps faculty refine their assignments and improve the quality of their teaching, which in turn helps students improve the quality of their learning.

Learning outcomes can be measured in a variety of ways: directly or indirectly, and qualitatively or quantitatively. Following are examples of these methods (Dugan & Hernon, 2002, p. 379):

- **Direct Methods**
  - *Qualitative*: developmental portfolios, think-aloud/think-after protocol, and directed conversations; and
• **Quantitative**: content analysis, evaluation of theses/dissertations, tests (even ones administered as pre- and post-tests), videotape and audiotape evaluation, and nationally developed tests

• **Indirect Methods**
  - **Qualitative**: focus group interviews, curriculum and syllabus evaluation, exit interviews, external reviewers, observation, self-assessment; and
  - **Quantitative**: general surveys; satisfaction surveys.

The ACRL list of information literacy best practices reiterates some of these suggestions for measuring outcomes and includes some more: “portfolio assessment, oral defense, quizzes, essays, direct observation, anecdotal, peer and self review, and experience” (ACRL, 2007a, Category 10). Librarians have taken up these suggestions and applied them, sometimes in unexpected ways. Following are examples of learning outcomes assessments geared specifically to measuring information literacy skills.

**Self-Assessment**

By asking students to review and evaluate their own work—either comparing it to previous work or to an established criterion—students can reflect on the strengths and weaknesses of their information literacy skills and determine where they need to improve. In this way, self-assessment actively involves students in their own learning. At the Queensland University of Technology in Australia, three types of self-assessment assignments are used in the campus’ information literacy course: a reflective journal, an information consultants’ search and an information resource guide (Edwards & Bruce, 2004).

The reflective journal assignment requires students to assess and summarize the lectures, tutorials and readings presented each week in class (Edwards & Bruce, 2004). Students are also asked to examine their information searching techniques and reflect on how to improve. The second assignment, information consultants’ search, gives students a choice of four topics to research (Edwards & Bruce, 2004). They are then asked to create a list of 10 to 25 resources that would best provide the information required, along with a brief summary of each source. The final assignment—and the one worth 50% of the grade for the class—is the information resource guide (Edwards & Bruce, 2004). This is a team project that asks students to create a resource
guide to a particular subject area. An abstract is required for each resource, and the group is asked to select the top five of their recommended sources.

Self-assessment assignments such as these not only give students a sense of empowerment and growth, they also provide instructors with insights into how well they are teaching and where they may need improvement. And on a time-management level—something of the utmost concern to all faculty members—these types of exercises don’t necessarily need to be graded.

The Paper Trail

At George Washington University in Washington, DC, librarians created an assignment called the Paper Trail (Nutefall, 2004). The assignment was given as part of a three-unit information literacy course titled “Oral Communication and Information Literacy.” Students were given six assignments on a variety of information literacy topics that they had to research. They then had to present oral reports on their findings. The topics included 1) organization of information; 2) searching the library catalog; 3) online periodical databases; 4) web evaluation; 5) searching the reference collection; and 6) the Paper Trail. The Paper Trail is described this way:

In conjunction with the completion of each student’s informative speech, they will argue for the merit of the research process that led them to create their speeches in this two-to-four page essay. The Paper Trail should allow the librarian and the communication professor to trace all of a student’s research. (Nutefall, 2004, p. 93)

“The Paper Trail assignment also required that students reflect on their research process, describing what worked, what did not, and what they would change” (Nutefall, 2004, p. 93). The assignment was graded by both the librarian (research process) and the instructor (content and citation style). The assignment proved to provide an excellent snapshot of student learning in the course as well as a window onto students’ research processes and the resources they used. These insights led to further refinements of the course.

Portfolios

“With selected samples of student work gathered over time, a map of change, hopefully a record of progress, can be seen” (Callison, 2006, para. 2). This is the theory behind the
portfolio method of assessment. As students progress through a course, a steady arc of improvement should be evident in their assignments, and instructors can grade portfolios on the progress shown. “Portfolios are most effective when students can compare earlier work in terms of progress in the level of sources used, selection of specific evidence and comparison of data, and growth in the depth of arguments presented” (Callison, 2006, Allowing for Comparisons).

Increasingly, universities are asking for electronic portfolios. The School of Library and Information Science at SJSU, for example, has recently made this a requirement for its graduates (SJSU SLIS, 2007). Students’ work is collected on content management servers where it can be reviewed and assessed by faculty at any time. Although electronic portfolios take up very little physical space, they can hold a great deal of information, including video, audio and graphics (SDSU, n.d.). They also have the added benefit of enhancing students’ computer skills.

At the University of Connecticut, an electronic portfolio was required for the campus’s for-credit information literacy course called Google This! (Sharma, 2007). The portfolio for the class called for students to do research for a 20-page paper. All their work was then uploaded to their own web page on WebCT with links to each section of their portfolio. The structure of a sample portfolio is shown in Figure 5.

Figure 5
Google This! Sample Portfolio
(adapted from Figure 1, Sharma, 2007, p. 130)

Cell Phones: How do they affect our health and safety?
1. Statement of Topic
2. Concept Map
   - Concept Map—Version 1
   - Concept Map—Version 2
   - Concept Map—Version 3
   - Concept Map—Version 4
3. Research Questions
4. Research Log
5. Research Strategy Worksheet
6. Selection of Online Sources
7. Annotated Bibliography
   - Websites
   - Books
   - Journal articles
8. Reflection on the semester

By requiring four versions of a concept map, students were able to see their own growth over time (Sharma, 2007). This also forced them to refine their information literacy skills as they sharpened and focused their research for each revision.

One obvious drawback to portfolios is the time required by instructors to review, assess and grade them (Lopez, 2002). In a class of any size, this task could become daunting. One way to minimize time spent on grading, however, would be to adapt the portfolio model to group work (Sharma, 2007). This would also provide an opportunity for the collaborative teams that are a cornerstone of active learning.

Although potentially time consuming for instructors, portfolios do offer an unsurpassed level of detail on students’ research abilities and application of information literacy skills. They are also perceived by faculty members as being both performance-based and genuine (Lopez, 2002). As Shikha Sharma (2007) notes, “When used correctly, portfolios can serve as more than folders filled with student work samples; they can facilitate collection of authentic evidence of student learning over time” (p. 129).

Surveys

The most ubiquitous of learning outcomes assessment is the survey (Jacobs, 2003; Julien, 2005; Powell, 2003; Willis & Thomas, 2006). At the University of Rhode Island, students in the credit-bearing information literacy course are given surveys that they can complete anonymously (Burkhardt, MacDonald & Rathemacher, 2005). The survey includes questions that are course content-specific and questions that ask students to evaluate how the course aided their research skills. Instructors evaluate the results of the surveys and make appropriate adjustments to the curriculum.
Surveys have even followed students after graduation. Some campuses have surveyed graduates and their employers to see what information literacy skills they’ve retained and used on the job (Rockman, 2002b). However, surveys have definite advantages and disadvantages (see Table 3). But their ease of use and easily quantified data on attitudes, knowledge and self-perceptions keep them perennial assessment favorites.

Table 3
Advantages and Disadvantages of Surveys
(adapted from UW-Stevens Point, 2006, Slide 5)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Self-administered, allowing time for the respondent to consider answers</td>
<td>• Frequent low percentage of returns</td>
</tr>
<tr>
<td>• Anonymity can promote more honest responses</td>
<td>• No assurance that the intended respondent understand the questions</td>
</tr>
<tr>
<td>• Relatively economical</td>
<td>• No assurances that the intended respondent actually completed the form</td>
</tr>
<tr>
<td>• Easy to score and analyze (if properly constructed)</td>
<td>• No opportunity to interact with the respondent to clarify, probe or seek substantiation</td>
</tr>
<tr>
<td>• Easy to seek respondents’ reaction to content that may be difficult for them to react to with other data collection methods</td>
<td></td>
</tr>
</tbody>
</table>


Best Practices and Recommendations

As this report has illustrated, establishing an information literacy program means keeping many academic and administrative balls in the air simultaneously. On-campus collaboration, educational design, assessment, instruction, change management—these are all factors that have to work in concert for an embedded information literacy program to succeed.

To review, SJSU is in the midst of a transformation, moving from a model of one-shot librarian lectures to an embedded information literacy program that grows in complexity from a student’s first year through to graduation. If successful, all SJSU graduates will be competent lifelong learners.

This report’s analysis of the current information literacy literature has yielded a variety of best practices and specific recommendations that might benefit SJSU in its journey to a new information literacy program model. Following are recommended best practices for implementing an embedded information literacy program at the client organization. In addition, these elements may be transferable to other organizations that are seeking significant rethinking, retooling, and repurposing.

Best Practices for Implementing an Embedded Information Literacy Program

Section 1: Embedded Information Literacy Program Design

When designing an embedded information literacy program:

- Create a roadmap for implementation that keeps change steady and gradual, working from individual courses up to the curriculum level;
- View the university as a system and stay sensitive to how each change can affect all the parts;
- Borrow institutional energy from already popular initiatives;
- Maintain a high profile on campus by attending departmental and administrative meetings;
- Practice respect and communication; and
• Reduce duplication of effort by consolidating all departments responsible for managing information—web design, telecommunications and libraries—into a single division.

Section 2: Embedded Information Literacy Program Model

When determining the educational model for an embedded information literacy program:
• Diversify instruction techniques in order to reach all styles of learners—auditory, kinesthetic and visual;
• Incorporate problem-based learning in order to help students learn by doing;
• Inform instructors of discipline-specific ways active learning techniques can be used;
• Educate instructors about techniques that bridge the difference between active and traditional teaching styles, such as interactive lectures; and
• Provide faculty training opportunities in a variety of formats to make them as accessible as possible.

Section 3: Organizational Change

When implementing change within the library:
• Follow the principles of the learning organization: systems thinking, team learning, shared vision, mental models and personal mastery;
• Demonstrate respect to faculty members by involving them at every stage of the change initiative;
• Communicate constantly using a variety of means—emails, wikis, listservs, flyers and meetings;
• Present information literacy as a unifying cause with the goal of creating lifelong learners; and
• Initiate collaborations with departments at every level of the university.

Section 4: Assessment

When assessing the value of an embedded information literacy program:
• Employ ETS’ iSkills™ to assess the success of information literacy instruction on a programmatic level; and
• Educate instructors on different methods of assessing learning outcomes—surveys, portfolios, and self-assessment—and the discipline-specific ways they can be applied to assess information literacy on a course level.

Recommendations

Embedded Information Literacy Program Design

In this report’s exploration of embedded information literacy program models, the University of Rhode Island’s approach stood out as worthy of emulation by SJSU, specifically its undergraduate curriculum mapping project. To recap, this project consists of:

• Identifying all courses that currently include information literacy instruction from librarians
• Identifying General Education courses that incorporate the “Use of information technology” skill
• Identifying capstone courses in each college/program and helping develop advanced information literacy opportunities within them

By breaking down the implementation of information literacy instruction in this way, librarians are given an instructional roadmap to follow. This would prevent librarians from feeling overwhelmed and also effect change in the gradual manner so beloved by universities.

A factor that could be borrowed from the University of Melbourne, although ambitious, is the creation of an Information Division. This would bring all of SJSU’s information departments—the library, the Department of Academic Technology, University Computing and Telecommunications, etc.—under one umbrella. This, of course, would be a university-wide effort, but by implementing this reorganization, duplication of effort would be eliminated and knowledge sharing enhanced in both the short and long term. And in the long run, it is also probable it would reduce costs.

An element to borrow from Cal Poly San Luis Obispo’s plan and one that is already in process at SJSU is systems thinking. By viewing SJSU not as a collection of discrete departments, but as an interconnected system, collaboration would become a natural part of
campus culture. In the short term, systems thinking will help librarians see the big picture as they seek innovative ways to tackle organizational problems.

Florida International University offers a strategy that has potential for SJSU. Librarians at FIU targeted the programs that were motivating faculty and administrators toward change, and accomplished their information literacy objectives by riding on the coattails of these programs. This is a backdoor as opposed to a front-door approach, but elements of this strategy might prove useful as the library moves forward. By borrowing the cachet of a popular movement such as distance education, the information literacy agenda at SJSU might be more easily accepted. And by consistently following this approach, the library would earn a reputation as an organization open to collaboration.

Transfer Students

SJSU has a very significant number of transfer students enrolling each year. To ensure these students have the information literacy skills they need to handle upper-division coursework, it is recommended that a rigorous online tutorial be created and that it be made mandatory for every transfer student. In this way, SJSU would be assured that all its students graduate with the lifelong learning skills they need and, in the long-term, would also improve the university’s student retention rates.

Collaboration

A takeaway from this report’s survey of on-campus collaborations is “meetings, meetings, meetings.” Librarians need to market themselves constantly by participating in campus and departmental functions whenever possible. Also key in promoting information literacy is a focus on faculty needs and concerns. By taking an attitude of “what can I do for you,” librarians can go far in implementing their information literacy objectives.

In addition, looking beyond faculty to other campus departments can help sustain information literacy efforts. At SJSU, units of the Department of Academic Technology are potential partners, and the library’s existing relationships with the Center for Faculty Development as well as the Academic Success Center could be strengthened and enhanced.

As always, crucial to any collaboration are respect and ongoing communication. Often it is the intangible element of attitude that can make or break a fruitful partnership. The forms of
Implementing an Embedded Information Literacy Program

Campus outreach discussed here will no doubt put a strain on librarians in the short run as their jobs change from an inward to more outward focus. But in the long term, keeping a high profile and consistently marketing the library “brand” will keep the library in the center of campus decision-making and demonstrate its openness to collaboration.

Embedded Information Literacy Program Model

Information Literacy Instruction for Students. The many aspects of active learning presented in this report can all be recommended as effective means for teaching information literacy at SJSU. Active learning makes students responsible for their own education and is more likely to involve all types of learners—auditory, visual and kinesthetic.

Problem-based learning, specifically, is extremely well suited to teaching information literacy skills. Providing “messy” problems to solve lets students learn by doing and helps improve their retention. Cooperative learning, another active learning technique, provides guidelines that lead to more fruitful group assignments. These guidelines are to give each member a role; grade members separately; and create diversified groups.

Some faculty members may not be ready to let go of the lecture format they’re familiar with. For these instructors, interactive lectures provide a compromise between the standard lecture and active learning. Interactive lectures intersperse short lectures with group discussions or hands-on activities that help involve all types of learners.

The acceptance of active learning may vary from department to department. In the short run, librarians will be kept busy promoting discipline-specific applications of the technique in order to persuade instructors of its effectiveness. But by consistently employing the active learning method, SJSU will graduate self-directed learners who are able to work well in groups, have improved retention of material, and strong research and evaluation skills.

Information Literacy Instruction for Faculty. As Woody Allen said, “Eighty percent of success is showing up.” And this is certainly the case for faculty development. To increase faculty participation in information literacy training, it’s important that the SJSU administration demonstrate its continuing commitment to implementing information literacy in the curriculum. By showing the importance of information literacy both in fulfilling accreditation requirements and for student learning, the administration can help impel faculty to take advantage of the library’s information literacy training options.
Another technique to increase faculty participation at SJSU is to tie information literacy goals to those of other popular campus programs, such as distance education. In this way, information literacy objectives can be accomplished while helping faculty achieve their own instructional aims. Other marketing techniques include collaborating with individual faculty members, attending departmental meetings and visiting faculty in their offices. On a national level, librarians need to be encouraged to write articles on information literacy for journals outside the library world. By promoting information literacy in discipline-specific or educational journals, information literacy will gain a higher profile within academia and begin to garner more respect and interest among faculty.

Once faculty members are motivated, how instruction is delivered becomes important. Choice and flexibility are the most important aspects to consider. Whether it is workshops, seminars, web-based tutorials, videos or podcasts, providing faculty with a range of formats empowers them and also gives them a variety of ways to fit information literacy instruction into their schedules.

In addition to choice and flexibility, respect for faculty members’ expertise in their discipline and for the many demands on their time is important. By creating a campus climate of courtesy and consideration, the goal of an embedded information literacy program will be made ever more accessible.

By increasing faculty participation in information literacy instruction, the library will provide a strong impetus to the implementation of its program. In the long term, faculty with strong information literacy skills will foster the growth of similar skills in their students.

Organizational Change

Of the change management models discussed in this report—the balanced scorecard, the learning organization and the Star Model—the principles of the learning organization are recommended as providing guidelines best suited to the King Library’s transformation. To recap, the principles that guide a learning organization are systems thinking, team learning, shared vision, mental models and personal mastery.

The library has already taken one step in the direction of a learning organization by forming librarians into teams by discipline (Arts and Humanities, Social Sciences, Science and Health, and Professional Schools). By working together, the librarians can break down their
individual information silos and make better informed, more knowledgeable decisions. This free flow of experience and expertise will also undoubtedly benefit how the information literacy initiative is implemented at SJSU.

Involving these teams in creating a shared vision of where the library is going comes as a logical next step. This year, staff retreats have helped move the library toward this goal. Also, simply going through the work of creating a vision statement will help transform current mental models to models that are increasingly invested in and supportive of the organization and its goals. In addition, being involved in deciding how the library moves forward will help library personnel in their aim of personal mastery. As Gisecke and McNeil (2004) note, “[T]he creative tension between the current reality and the future goal is a key part of personal mastery” (p. 57).

Communicating the big picture to library personnel—systems thinking—will be aided by the expertise of associate dean Mary Somerville. From her experience of implementing organizational change at Cal Poly San Luis Obispo, Dr. Somerville brings with her many tools for managing the challenges change brings. Like Cal Poly San Luis Obispo, SJSU needs to modify its organizational structure, its service priorities and its staff assignments. By demonstrating the interconnectedness of every part of the library and the university, new approaches to organizational transformation may appear.

By implementing the elements of the learning organization model, SJSU can become one of the organizations “that create a climate that fosters learning, experimenting, and risk taking” (Giesecke, 2004, pp. 54-55). In addition, it will develop employees “who appreciate change, accept challenges, can develop new skills, and are committed to the organization’s mission, goals, and objectives” (Giesecke, 2004, p. 55). Backed by this type of vibrant environment, the library’s information literacy initiative will thrive.

Organizational Culture. One of the library’s biggest challenges is to help create an organizational culture on campus where cooperation and professionalism are the norm. Toward this goal, it is recommended that the library demonstrate through its actions and policies a commitment to mutual respect among campus employees and the importance of communication, education, and collaboration to advancing this respect.

Respect can be expressed by involving faculty at every level of the library’s information initiative—from planning through implementation. By including faculty members in all aspects
of its plan, the library will demonstrate its respect for their instructional expertise, and also shows its support for the principle of collaboration on campus.

To provide support for its partnerships, it’s important that the library demonstrate good communication skills. The library should employ all possible channels to communicate its goals—email, wikis, listservs and flyers. It should also strive to vary the way it communicates with any given department. In this way, the “optimal communication medium” will be established (Wood et al, 2007, p. 23).

Educating the campus community about the importance of information literacy instruction is going to be an ongoing challenge for the library. It is recommended that information literacy be presented as a “unifying cause” that accomplishes many of the instructional and curricular goals of the faculty and administration (Shane, 2004, p. 92). By talking the same language, it will be much easier for the library to get cooperation from other campus departments.

It is in the area of collaboration that the library’s actions must speak the loudest of all. By taking the initiative to partner with faculty, librarians can promote themselves as academic equals working toward the same educational ends. These partnerships will also work to engage faculty in an area where they might otherwise be apathetic. Collaborating with other campus departments will also demonstrate the library’s belief in the importance of cooperation.

If the library consciously works to demonstrate its commitment to mutual respect, communication, education and collaboration, the one certain result is that the campus culture will be enriched and improved by the strong positive influence it exerts. In the short term, however, librarians will undoubtedly have to be encouraged and guided in their efforts to demonstrate these qualities in their interactions with campus faculty and staff.

Assessment

On a program level, it is recommended that iSkills™ be chosen as the tool used for assessing information literacy competencies at SJSU. Although at $22.00 a test it is more expensive than alternative tests such as SAILS and ILT, iSkills™ offers a level of assessment that can’t be matched by simple multiple-choice tests.

At this time, the library has tentative plans to administer the Core Academic Assessment version of iSkills™ to all incoming freshmen. In two years time, it is recommended that this
same class be tested using the Advanced Academic Assessment version of iSkills™. Comparing the “before” and “after” performance of these students will provide invaluable information on the strengths and weaknesses of SJSU’s information literacy program and show where it needs improvement.

It’s also recommended that all incoming transfer students be administered the Advanced Academic Assessment test. The results from this testing would be an excellent source of information on how much or how little information literacy instruction is being done at the community-college level. This would subsequently help guide the library’s decisions on what type of instruction these students may need to be prepared for upper-division courses at SJSU.

To assess learning outcomes, it is recommended that the techniques used should be guided by discipline. A reflective journal assignment might work best in a large sociology course, while an electronic portfolio might be better suited to a small computer science course. While all the techniques investigated—surveys, portfolios, the Paper Trail, and self-assessment—are excellent assessment tools, it is ultimately the structure of the class and the individual instructor that should determine which one is used.

More important, perhaps, is that instructors across campus are knowledgeable about these assessment measures and know how to utilize them. Their education on this topic is something that should be included in librarians’ discipline-specific duties. By demonstrating how these assignments can be used in specific departments and courses, librarians can help improve faculty teaching methods and speed the use of plagiarism-proof learning outcomes assessment tools.
Summary

To reach their goal of an embedded information literacy program, the librarians at SJSU still have a lot to accomplish. But while involved in the intricacies of program design, assessment and organizational change, it is important that they not lose sight of the motivation behind all the effort involved. That is, when the program is successful and all SJSU students graduate with strong information literacy skills, they will make better citizens, better workers and have an improved quality of life. As Dane Ward (2006) of Illinois State University writes:

After all, information… is pervasive. We are immersed in an information ocean like fish in water. Somewhat oblivious to the many ways we interact with it, we receive it steadily through the senses and through intuition. We process it individually and collectively, subjectively, objectively, emotionally, and analytically. (p. 396)

By giving students the ability to navigate this information ocean, the librarians at SJSU are making a positive difference in their community and the world, because inextricably bound up in the growth of information literacy is the growth in self-understanding and humanity (Ward, 2006). And that is certainly a goal worth working toward.
References


An anecdotal report on information literacy at several New York universities, this article provides some interesting insights on how librarians are handling the demand for information literacy.


This article explores who should be responsible for delivering information literacy instruction and exactly what is meant by the concept of information literacy. An interesting review of current literature on these subjects is provided.


Although now 18 years old, this report still provides an excellent introduction to information literacy and its importance to schools, individuals, and businesses. It also provides an exploration of how to develop information literacy in the schools.


This list of guidelines strives to identify the very best in information literacy principles. Although not meant to be a definitive guide, it’s a very good starting point for universities beginning a new program.

Implementing an Embedded Information Literacy Program

This is the home page for ACRL’s immersion programs.


This entertainingly written article examines the dynamics between librarians and faculty. It also offers collaboration techniques and tips.


Written by two librarians from the Queensland University of Technology in Australia, this article gives details on the information literacy program in that campus’s nursing program. This is a very interesting examination of the importance of information literacy in evidence-based medicine.


This paper explores the process of creating the TSISL teaching tutorial for the University of New South Wales in Australia.


IAKT stands for “I already know this,” a typical student response to information literacy instruction. This article provides some methods to engage students and overcome their initial skepticism.


Using data from workshops sponsored by the Council of Independent Colleges and the National Institute for Technology & Liberal Education, this article provides an overview of information literacy trends at some 130 institutions.

This book is a revision of the authors’ 1989 title, *Information Literacy: Revolution in the Library*. It provides an excellent introduction to curriculum reform, change management and leadership in regards to implementing information literacy in colleges and universities.


This article provides some excellent background on the information literacy program at San Jose State University as it was implemented in 2004.


This article examines an extensive literature review of the use of information literacy training in medical programs. Also provided is an interesting critique on assessment methods.


A very interesting article, it follows the creation of the information literacy program at the University of Melbourne and the approach to organizational change that was used.


Bruce is one of the premier voices in the field of information literacy, and this paper discusses key steps in implementing information literacy and provides some case studies.

This book provides information literacy guidelines as they are practiced in Australia and New Zealand.


The authors of this book were all involved in implementing the embedded information literacy program at the University of Rhode Island. This text walks the reader through the steps necessary to plan and implement a similar program.


This article provides details on the embedded information literacy program at the University of Rhode Island.


This website provides a summary of the information literacy activities offered by the Cabrillo College librarians.


This web page provides links to information on the grants awarded through the California State University information competence initiative as well as background on the initiative’s creation and implementation.

This web page provides links to details on all the information literacy projects created through the California State University information competence initiative.


Located on the American Libraries Association web site, this article provides an excellent introduction to using portfolios for assessment.


Written by the dean of University Libraries at USC, this article examines possible new missions for academic libraries as information becomes increasingly digitized.


This article provides an introduction to soft systems methodology and looks at how the theory has evolved since its creation over 30 years ago.


Although focused on federated search products, this article also provides a concise overview of information literacy trends.


This article reports on the findings of in-depth interviews of librarians at six university campuses in Atlantic Canada. It provides some interesting insights in librarians’ views on information literacy instruction.

This article provides an excellent history of the information literacy initiative in the California State University system.


This is the third report of the Information Competence Work Group that was created to implement the information competence initiative in the California State University system. It provides some background on the initiative and details its early achievements.


This article examines the use of soft systems methodology as it was used at Cal Poly San Luis Obispo.


The authors present a plan for using different types of assessment techniques and demonstrate how traditional input/output measures do not provide a complete picture.


This web page provides an excellent introduction to the principles of evidence-based medicine.

This web page provides an introduction to information literacy and covers the different ways it can be implemented at campuses in the California State University system.


This report was prepared by ETS to demonstrate the importance of information literacy and to explore the ways in which information literacy competencies could be assessed.


This web page provides links to information on the iSkills™ information literacy assessment test.


This article examines how students conduct computer searches, and the teaching techniques and assignments that work best to help them learn better skills. Ways to assess students’ competencies are also discussed.


This book provides an introduction to information literacy and provides examples of how it is being implemented at both the K-12 and university levels.


This is the information literacy proposal presented to the Academic Senate of Florida International University. It provides details on how transfer students can meet information literacy requirements.

This web page provides enrollment statistics and general information about Florida International University.

This is Dr. Galbraith’s consulting web site. It provides an introduction to his Star Model of organizational design.

At the University of Nebraska—Lincoln Libraries, it was decided that the libraries should become learning organizations. This article explores learning organization concepts and their pros and cons.

This article explores how information literacy can be tailored to different departments and disciplines.

This is a case study of how an embedded information literacy program was implemented at the University of Guelph in Ontario, Canada.

This interesting report details how information literacy programs are being implemented at California community colleges and state universities.

This examination of problem-based learning explores how well students learn when taught using this pedagogical technique.


At Utah State University, information literacy instruction is integrated into two core English composition courses. This article details the implementation of this program.


Twelve librarians involved in extensive organizational change at their libraries were interviewed for this article. Their different approaches to organizational transformation are examined in detail.


Presented by librarians from the University of Toronto, Mississauga, this PowerPoint presentation details how that campus implemented its information literacy program.


Written by librarians from Zayed University in the United Arab Emirate, a campus chosen by the ACRL as one of ten in the world demonstrating best practices, this article examines how the ACRL guidelines have been applied and how well they have worked in practice.
This paper provides the history of Florida International University’s information literacy programs and details on its implementation.

This article examines how collaboration was used when implementing the information literacy program at Florida International University.

This web page provides information on the Instruction Commons and e-Library at Iowa State University.

This web page lists enrollment statistics and other fast facts about Iowa State University.

Collaboration between faculty and librarians served as the foundation for implementing the information literacy program at the University of Waikato in New Zealand. The article provides an examination of the strategies used to initiate and sustain these partnerships.

A system-wide information literacy program was launched at the New York University Division of Nursing, and this article provides details on its implementation, successes and challenges.

This web page provides information on the Information Literacy Test created and distributed by James Madison University.

This web page provides details on the information literacy workshop offered by James Madison University to its General Education faculty.

Written by the director of organization development and training at the University of Washington Libraries, this short article provides a strong argument for the benefits staff development in the library provides to a university.

This article examines how outreach and collaboration has been handled at Washington State University. Two case studies are detailed: information literacy instruction through WSU’s Freshmen Seminar and its College of Pharmacy.

This interesting study looks at how collaboration and outreach have changed over the past decade in Canadian academic libraries. Over 400 libraries were surveyed in 1995, 2000 and most recently in 2005. This article surveys the results and draws some interesting conclusions.

A fascinating review of the posts made to the Information Literacy Instruction Listserv, this article provides some intriguing insights into librarians' attitudes toward both information literacy and faculty.


Entertainingly based on Sun Tzu’s *The Art of War*, this article demonstrates the strong influence academic culture brings to bear on curriculum reforms, such as information literacy education, and provides strategies on how to counteract its power.


This web page provides information on the Standardized Assessment of Information Literacy Skills test created and distributed by Kent State University.


This comprehensive literature review examines 55 studies in-depth to determine the effectiveness of the different information literacy instruction methods used.

Learning 2.0 (n.d.) #1 (Week 1). Read this blog & find out about the program. Retrieved June 23, 2007 from http://sjlibrarylearning2.blogspot.com/

This is the home page of the Learning 2.0 tutorial used to train participants in how to use Web 2.0 technologies, such as blogging, RSS news feeds, tagging, wikis, and podcasting.

Including a discussion of different methods of collaboration, this article provides details on the campus-wide information literacy program at Iowa State University.


The University of South Carolina, Aiken, incorporated information literacy standards into its general education curriculum. This article examines the strategic planning and faculty development methods used.


An excellent introduction to assessment methods for information literacy instruction, this article also discusses the Higher Learning commission’s assessment matrix.


This article provides the history and details on the implementation of the embedded information literacy program at the University of Rhode Island.


Two collaboration models—teaching alliances and campus partnerships—are discussed in detail in this article, and it is shown how they were implemented at the University at Albany in New York.


Written by the librarian and faculty member who were closely involved, this article details the implementation of an information literacy program at Purdue University. Two
science courses were the first to integrate information literacy competencies and the article details the process.


This article provides an Irish perspective on faculty attitudes to information literacy. Written by a librarian at the University College Dublin, her survey shows faculty believe that students will pick up information literacy skills without formal instruction.


Located in the Netherlands, Maastricht University has been using problem-based learning techniques campus-wide for more than 30 years. This fascinating article examines how instruction has evolved—and devolved—over this period of time.


The Paper Trail is an information literacy assessment technique used at George Washington University. This article gives details on how to implement it in the classroom.


This web page presents the topics covered in Oberlin College’s faculty development workshops on information literacy and discusses the instruction techniques used.


This article provides an examination of the feedback lecture, a pedagogical technique that involves students in their own learning and provides a bridge between the standard lecture format and active learning techniques.

The author of this article is a proponent of for-credit information literacy courses that are built-in to the undergraduate curriculum. He explores the rationale behind this approach, possible resistance on campus and presents some ideas on implementation.


This unusual article follows up on recent Ohio State University graduates of the campus’s Occupational Therapy division, to see how well and how often they apply the information literacy skill learned in college to their jobs.


This web page records testimonials from faculty about the information literacy program at the Queensland University of Technology.


This article examines how cooperative learning techniques can be implemented at the university level.


This essay explores how using the Myers-Briggs Type Indicator can facilitate collaboration on campuses.

This article describes the faculty outreach efforts of the librarians at Northwest Vista College. Details are provided on the workshops and other forms of collaboration used.


This article provides an excellent introduction to information literacy and highlights the impact it has on education and society.


This article examines the importance of strategic alliances and assessment in implementing information literacy programs. Special attention is paid to the information literacy initiative in the California State University System.


The Information and Communication Technology (ICT) Literacy Assessment was the beta version of what became the iSkills™ assessment test. This article provides background on its development and provides a look at other popular assessment tools.


Currently an assistant vice chancellor in the California State University system, the author explores the information-seeking behavior of students and the different information literacy programs within the CSU system.

This web page provides a concise report on the benefits of electronic portfolios as assessment tools.


This resolution gives the mandate for integrating information literacy competence skills into the SJSU curriculum to the university library.


This web page provides enrollment statistics and general information about San Jose State University.


This web page is offered by the Center for Faculty Development and offers links to several teaching resources.


The electronic portfolio requirements for SJSU SLIS students are provided on this web page.


The University of Virginia Library used the balanced scorecard approach to implement change. The implementation process is discussed here, and details on the metrics the library used are provided.

Shane, J. M. Y. (2004). Formal and informal structures for collaboration on a campus-wide information literacy program. Resource Sharing and Information Networks, 17(1/2), 85-
A well-written introduction to the factors that affect the implementation of information literacy programs on campus, this article also provides information on faculty-librarian collaboration as well as case studies.


Sharma, S. (2007). From chaos to clarity: Using the research portfolio to teach and assess information literacy skills. *Journal of Academic Librarianship, 33*(1), 127-135. Retrieved July 1, 2007, from ERIC via CSA database. This article shows how web-based portfolios are used as information literacy assessment tools at the University of Connecticut.


This article provides a case study of the organizational change project implemented at Cal Poly San Luis Obispo. Systems thinking and employee development are discussed.


This article explores how systems thinking and soft systems methodology was used at Cal Poly San Luis Obispo and at the Luleå University of Technology in Sweden to manage change.


This article examines the use of systems thinking and interactive planning in the implementation of a campus-wide information literacy program at Cal Poly San Luis Obispo.


This currently unpublished article explores the creation of the iSkills™ information literacy assessment test and reviews its methodology.


This article argues for the use of problem-based learning when teaching information literacy. A case study of its use at Penn State University is included.

This interesting survey of 54 non-library journals illustrates how seldom information literacy is discussed in disciplines other than library science.


This article examines the challenges facing academic libraries today and how to confront them.


This article provides information on integrating information literacy standards into the curriculum department by department.


This article explores how accreditation standards are pushing the demand for information literacy instruction in universities, and the roles librarians and faculty play in its implementation. It also stresses the importance of collaboration in achieving curriculum reform.


This web page offers details on the information literacy workshops and other faculty development tools offered by the Touro College Libraries.


This online tutorial for faculty gives step-by-step instructions on how to create and evaluate assignments that incorporate Touro College’s information literacy competency standards.
This links provides an organizational chart of the TeLaRS division of the University of Melbourne, Australia.

This is a PDF of the brochure that explains the University of Melbourne’s new Melbourne Model program.

This web page provides details on the Plan for Information Literacy at the University of Rhode Island.

This web page provides links to the University of Rhode Island’s enrollment statistics for the last seven years.

Compiled by the University of South Dakota, this link provides a list of the attributes of visual, auditory and kinesthetic learners.

This is the home page of the University of Virginia Library’s balanced scorecard effort. It provides links to details on the metrics used and results of this program.

This is the home page of UWParkside’s Information Literacy Tutorial. The page also contains information on the information literacy requirements at the university.


This PowerPoint presentation was designed for a workshop on how to create surveys that can be used as assessment tools.


This article explores two approaches to teaching information literacy: the behavioral and the constructivist. Also examined are the barriers to implementing information literacy reforms within the curriculum.


This interesting article explores how information literacy skills can affect an individual’s quality of life.


This is a PDF of the WASC Handbook of Accreditation. It details all the requirements universities and colleges must meet to become accredited institutions.


This article explores different ways to motivate faculty and get them involved in campus-wide information literacy efforts. Factors such as environment, training methods and program content are discussed.

As the title states, this article argues that current trends in information literacy “offer the wrong solution to the wrong problem” (p. 13).


A well-reasoned article from England that argues that information literacy is a movement whose time has come and gone.


This article encourages librarians to determine students’ learning preferences and to base their teaching strategies on them.


This book provides an excellent introduction to managing change in academic libraries. Included are extensive case studies of organizational change within the University of Pittsburgh’s University Library System and the University of Arizona Libraries.
Appendix A

Characteristics of Programs of Information Literacy that Illustrate Best Practices

Category 1: Mission

A mission statement for an information literacy program:

• includes a definition of information literacy;
• is consistent with the “Information Literacy Competency Standards for Higher Education” [http://www.ala.org/acrl/ilcomstan.html];
• corresponds with the mission statements of the institution;
• corresponds with the format of related institutional documents;
• clearly reflects the contributions of and expected benefits to all institutional constituencies;
• appears in appropriate institutional documents;
• assumes the availability of and participation in relevant lifelong learning options for all—faculty, staff, and administration; and
• is reviewed periodically and, if necessary, revised.

Category 2: Goals and Objectives

Goals and objectives for an information literacy program:

• are consistent with the mission, goals, and objectives of programs, departments, and the institution;
• establish measurable outcomes for evaluation for the program;
• reflect sound pedagogical practice;
• accommodate input from various constituencies;
• articulate the integration of information literacy across the curriculum;
• accommodate student growth in skills and understanding throughout the college years;
• apply to all learners, regardless of delivery system or location;
• reflect the desired outcomes of preparing students for their academic pursuits and for effective lifelong learning; and
• are evaluated and reviewed periodically.

Category 3: Planning

Planning for an information literacy program:
• articulates its mission, goals, objectives, and pedagogical foundation;
• anticipates and addresses current and future opportunities and challenges;
• is tied to library and institutional information technology planning and budgeting cycles;
• incorporates findings from environmental scans;
• accommodates program, department, and institutional levels;
• involves students, faculty, librarians, administrators, and other constituencies as appropriate to the institution;
• establishes formal and informal mechanisms for communication and ongoing dialogue across the academic community;
• establishes the means for implementation and adaptation;
• addresses, with clear priorities, human, technological and financial resources, current and projected, including administrative and institutional support;
• includes mechanisms for articulation with the curriculum;
• includes a program for professional, faculty, and staff development; and
• establishes a process for assessment at the outset, including periodic review of the plan to ensure flexibility.

Category 4: Administrative and Institutional Support

Administration within an institution:
• identifies or assigns information literacy leadership and responsibilities;
• plants information literacy in the institution’s mission, strategic plan, policies, and procedures;
• provides funding to establish and ensure ongoing support for
  ■ formal and informal teaching facilities and resources
  ■ appropriate staffing levels
  ■ professional development opportunities for librarians, faculty, staff, and
    administrators; and
• recognizes and encourages collaboration among disciplinary faculty, librarians,
  and other program staff and among institutional units;
• communicates support for the program;
• rewards achievement and participation in the information literacy program within
  the institution’s system.

Category 5: Articulation with the Curriculum

Articulation with the curriculum for an information literacy program:
• is formalized and widely disseminated;
• emphasizes student-centered learning;
• uses local governance structures to ensure institution-wide integration into
  academic or vocational programs;
• identifies the scope (i.e., depth and complexity) of competencies to be acquired on
  a disciplinary level as well as at the course level;
• sequences and integrates competencies throughout a student’s academic career,
  progressing in sophistication; and
• specifies programs and courses charged with implementation.

Category 6: Collaboration

Collaboration among disciplinary faculty, librarians, and other program staff in an
information literacy program:
• centers around enhanced student learning and the development of lifelong
  learning skills;
• engenders communication within the academic community to garner support for
  the program;
• results in a fusion of information literacy concepts and disciplinary content;
• identifies opportunities for achieving information literacy outcomes through course content and other learning experiences; and
• takes place at the planning stages, delivery, assessment of student learning, and evaluation and refinement of the program.

Category 7: Pedagogy

Pedagogy for an information literacy program:
• supports diverse approaches to teaching;
• incorporates appropriate information technology and other media resources;
• includes active and collaborative activities;
• encompasses critical thinking and reflection;
• responds to multiple learning styles;
• supports student-centered learning;
• builds on students’ existing knowledge; and
• links information literacy to ongoing coursework and real-life experiences appropriate to program and course level.

Category 8: Staffing

Staff for an information literacy program:
• include librarians, disciplinary faculty, administrators, program coordinators, graphic designers, teaching/learning specialists, and others as needed;
• serve as role models, exemplifying and advocating information literacy and lifelong learning;
• are adequate in number and skills to support the program’s mission;
• develop experience in instruction/teaching and assessment of student learning;
• develop experience in curriculum development and expertise to develop, coordinate, implement, maintain, and evaluate information literacy programs;
• employ a collaborative approach to working with others;
• receive and actively engage in systematic and continual professional development and training;
• receive regular evaluations about the quality of their contribution to the program.

Category 9: Outreach

Outreach activities for an information literacy program:

• communicate a clear message defining and describing the program and its value to targeted audiences;
• provide targeted marketing and publicity to stakeholders, support groups and media channels;
• target a wide variety of groups;
• use a variety of outreach channels and media, both formal and informal;
• include participation in campus professional development training by offering or co-sponsoring workshops and programs that relate to information literacy for faculty and staff;
• advance information literacy by sharing information, methods and plans with peers from other institutions; and
• are the responsibility of all members of the institution, not simply the librarians.

Category 10: Assessment/Evaluation

Assessment/evaluation of information literacy includes program performance and student outcomes and:

• for program evaluation:
  ■ establishes the process of ongoing planning/improvement of the program;
  ■ measures directly progress toward meeting the goals and objectives of the program;
  ■ integrates with course and curriculum assessment as well as institutional evaluations and regional/professional accreditation initiatives; and
  ■ assumes multiple methods and purposes for assessment/evaluation
    ▪ formative and summative
    ▪ short term and longitudinal;

• for student outcomes:
acknowledges differences in learning and teaching styles by using a variety of appropriate outcome measures, such as portfolio assessment, oral defense, quizzes, essays, direct observation, anecdotal, peer and self review, and experience;

- focuses on student performance, knowledge acquisition, and attitude appraisal;

- assesses both process and product;

- includes student-, peer-, and self-evaluation;

- for all:

  - includes periodic review of assessment/evaluation methods.

(Association for College and Research Libraries, 2007)