

Information Literacy Teams: Bridging the Fluency Divide

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Introduction

"The quality and quantity of information needed to function effectively in society and the workplace continues to increase. Individuals...must be able to master rapidly changing information technology and possess the information literacy skills to act independently in this information rich environment¹."

The fluency divide

According to futurists, in the next decades, information will be doubling every eleven minutes. Yet, there is a growing concern that we are going toward aliteracy. This term is not associated with the inability to read, but the unwillingness to read. A recent study in Spain reported that over 90% of the students surveyed said they only read when it was necessary. "Fluency divide" refers to the division between the people who passively consume information and those who possess the motivation and skills to locate, select, organize, and apply information². "Evidence is rapidly mounting that students cannot select appropriate sources of information, do not understand the structure or purpose of different sources of information, and cannot critically evaluate the information they retrieve"³. The Journal of Chemical Engineering Progress' survey of chemical engineers reveals that more than half of survey respondents are not able to find and use appropriate information³.

In engineering and other sciences, students may depend on textbooks for most of their undergraduate learning, and many do not develop retrieval skills until their senior year or graduate school³. Very little research has shown the attitudes of engineering faculty regarding bibliographic instruction (BI), but general guidelines have emerged in the last decade demonstrating that context-sensitive IL instruction is critical.

Since the 1950's, academic librarians have been integrating library or bibliographic instruction (now known as Information Literacy) into the undergraduate curriculum⁴. IL made its debut with the rapid development in information technology, where "the knowledge based economy is characterized by the need for continuous learning of both codified information and the competencies to use this information. . . . The skills and competencies relating to the selection and efficient use of information become more crucial"⁵.

In this paper we define IL as the capability of a person to recognize the "different levels, types and formats of information and their appropriate uses; the ability to place information in a context. An awareness of information access issues (copyright, privacy, globalization, currency of information, etc.) are key to information literacy"⁶.

IL is a necessary, basic competency required for all people to compete and succeed in the university and at work⁷, fast becoming one of students' most essential skills. Students facing the economic world of the 21st century need to know more than where the reference section is: they need to know about electronic information sources, know the uses of Boolean logic, and be able to analyze, synthesize and think critically. Critical thinking is an essential aspect of database proficiency⁸. Students also need to understand the issues of free speech, censorship, access, and privacy, the ethical issues surrounding the dissemination, accessibility, and use of information⁹.

As early as the 1930s, Edith Coulter said that libraries should help students be self-reliant in the library by teaching them how to find information¹⁰. Self-sufficiency continues to be an important goal of library instruction because IL is fluid; as technology changes, expertise in reading, writing, critical thinking, visual literacy, mathematics, computers, and research play a role in being information literate.

Recently, Abram and Luther¹¹ described today's students as NextGens (people born between 1982 and 2002), who do not see any difference in credibility or entertainment value between print and media formats. NextGens enjoy the exploration, navigation and discovery available to them on information appliances such as desktops, mobile telephones and PDA's¹¹. They prefer and are accustomed to "Googling it" and like the convenience of the mouse-click, readable search engine, even though it yields articles, blogs, discussion threads, web sites, and/or encyclopedia items without discrimination. NextGens are nomadic and expect information to be available to them 24/7. They like to multitask. Growing up playing video games, to them content and technology are inseparable¹¹. How do we bridge the literacy of one generation with the emerging, technology-embedded literacies of the future? A small group of faculty and librarians have been meeting regularly at our college to consider this question.

The IL Group: collaborative course innovation

The IL Group at Kansas State University-Salina College of Technology and Aviation is a group of four: two librarians and two faculty (English and Chemistry committed to developing a matrix of instructional activities to enlarge the role of IL in the "life of the curriculum"¹².

Kissick and Alysia Starkey, Library Technology Specialist, had launched an online tutorial of library services the previous year, wanted to make contact with faculty to learn more about the role of the tutorials in student learning, which have been shown to support ongoing instruction effectively⁷. With Jung Oh, professor of chemistry, the four became a group with the goal of exploring how IL instruction could be adopted into cooperative faculty's existing curricula. Because assessment programs were currently being planned university-wide, the IL Group also investigated ways to assess information literacies across curriculum.

We adopted three near-term goals, the focus of this report:

- Identify cooperative faculty willing to collaborate on inservice visits tailored to the needs of specific courses taught.
- develop and pilot course assignments that integrate inservice librarian visits with course content.
- meet regularly to discuss, evaluate, revise, and reimplement our collaborative project.

Review of literature

Information literacy can be defined as a set of capabilities; however, it is also an instructional and intellectual movement¹³, similar to cross-curricular writing programs that emerged in the late 1960s with the writing-process movement. Instruction in IL is now viewed as an array of activities in an institutional, collaborative, cross-curricular process, rather than a discrete visit by librarians to classrooms, or a course isolated from the rest of the curriculum.

One-time demonstrations of information-retrieval skills out of context, do not "coincide with students' need for information, are sometimes not valued by the students, and do not prepare them for the challenges of research, problem-solving and continuous learning"¹⁴. The process of seeking, evaluating, and using information is emphasized in more current models of IL instruction, where information becomes part of the overall learning process or knowledge management¹⁴.

Studies reveal that faculty are a primary influence on students' attitudes toward IL, and their perception of it as integral to their curricula. Faculty attitudes toward IL instruction vary; many science and engineering faculty have been found to be "more indifferent to the role of the library in undergraduate education than their colleagues in the social sciences and humanities"³. Nonetheless, across curriculum, most faculty favor a shared approach to teaching information-related skills.

The timing and tailoring of library instruction is crucial,² and an adaptable pedagogical approach is often required, which is only possible through direct liaison with departments and individual faculty on an interpersonal level. Faculty often need hands-on training as well, to upgrade their own information-seeking behaviors. IL would also ideally result in self-directed inquiry, or self-sufficient searchers, where assistance from a professional librarian is not required.

At the same time, librarians face innovative new roles in the evolving information age, as our IL Group demonstrates. Though they have served to educate students and faculty in the past, new emphasis emerges on librarians' responsibilities to

- prepare to become effective teachers in IL programs,
- support librarians, faculty, and administrators in assuming leadership roles in the development and implementation of IL programs
- develop new relationships in the educational community to foster IL curriculum development¹⁵.

The goals of instruction in IL have been clearly described by The Task Force on Information Literacy for Science and Technology, which drew on several member accrediting agencies to correlate disciplinary ways of knowing to the American Library Association's IL learning outcomes:

Standard One: Identifying the need for information

Standard Two: Procuring the information

Standard Three: Evaluating the information, revising search strategy, obtaining more information

Standard Four: Using the Information

Standard Five: Lifelong learning

<http://sciencelibrarian.tripod.com/ILTaskForce/SYNOPSIS>

For each of the standards, the task force has developed observable assessment measures, assisting librarians and faculty in the task of developing appropriate, context-specific curriculum.

Finally, beyond the academy, human resource workers have identified ten key knowledge skills necessary for the knowledge managers of the future¹⁶. These skills are strongly related to IL competencies. For example, the use of information for advocacy, (as shown in the table below), is related because advocacy entails a generalized, overarching set of IL skills, not specific to any discipline or program of academic instruction:

Knowledge Manager Skills	Information Literacy
Time Management Skills	Use time and energy effectively to acquire knowledge
*Mastery of Learning	Absorb key knowledge quickly; learners learn how they learn
*Skills of Advocacy and Inquiry	Present knowledge and gather information from others for the benefit of identified groups
*Informal Networking Skills	Build influence and gain access to people with knowledge, potential mentors
*Resource investigation skills	
*Effective IT Skills	For recording and disseminating information
*Skills of Cooperative Problem- Solving	Teamwork
Open Dialogue Skills	
Flexibility	Willing to take educated risks
*Ability to Review Risk	Review risks, opportunities and successes. Learn from failures
*(entail IL skills)	

Table 1: Information Literacy from Employers' Perspective: Knowledge Skills of the Future

The University of Virginia project¹⁷ integrating chemical information into the undergraduate chemistry curriculum as part of the institution's IL program is one example of newly developed IL pedagogy to support more effective student competencies. The University of Oklahoma proposed a model¹⁸ to incorporate IL into upper-level undergraduate science courses and adopted an instrument for measuring IL. By recognizing similarities that exist between science-teaching standards (the National Science Education Standards) and information standards (American Association of School Librarians' Information Power Standards) and sharing their common interest in student learning, librarians and science teachers can form meaningful partnerships¹⁹. In developing collaborative relationships to create learning community, the nature of interactions among the librarians, faculty members and the students become crucial²⁰.

Because librarians have identified the need for IL instruction and have begun to explore with faculty effective pedagogical means for collaborating on instruction, our IL Group spent the spring of 2004 in a variety of activities aimed at developing IL instruction here at KSU-S.

Planning

After meeting several times, the IL Group identified areas of shared concern to foster IL curriculum development. Though our goals are far-reaching and wide-spread, we have identified small projects for immediate implementation.

Near-term goals:

- Identify cooperative faculty willing to collaborate on inservice visits tailored to the needs of specific courses taught.
- Develop and pilot course assignments that integrate inservice visits with course content.
- Meet regularly to discuss, evaluate, revise, and reimplement our collaborative projects.

Mid-range goals:

- Develop a plan for assessing IL across curriculum.
- Identify where IL instruction is currently taking place in major programs and options at the College of Technology and Aviation (COTA) (Engineering Technologies, Aviation Professional Pilots Program, Airframe and Powerplant Maintenance, and Technology Management).
- Develop means to evaluate the effect of the inservice visits/faculty-library collaboration.

Long-term goals:

- Recruit specific faculty teaching key, capstone courses for the purpose of planning assessment measures in coordination with college-wide assessment plans:
 - Engineering: First year seminar
 - Engineering: Senior project
 - Construction Technology (Associates) research of equipment, products
 - Technology Management Project class

The remainder of this report describes the IL Group's efforts on their near-term goals. These occurred over a range of small projects throughout 2003-2004:

- Survey of library use, college-wide, 2002-2004
- Surveys of faculty instruction of IL, 2003
- Online tutorials
- Course-specific Section Guides
- Inservice materials and classroom visits

Survey of library use

In the past, to assess the library's contribution to curriculum a survey of students and faculty was administered (Appendix A). The results of that survey were comprehensively reviewed, showing that the library database use has increased by 24.3% in the last two years, although enrollment has remained constant.

Faculty Instruction of IL

The IL Group administered a survey of faculty who are teaching information literacies by adapting the American Library Association Learning Outcomes to a series of questions (Appendix B). Questions for example, asked faculty if they:

1. Assign some form of library or information-retrieval project at least once a semester
2. Assign students specific information-gathering tasks
3. Have students determine the extent of information needed
4. Access the needed information effectively and efficiently
5. Evaluate information and its sources critically
6. Use information effectively to accomplish a specific discipline related goal
7. Understand the economic, legal, and social issues surrounding the use of information
8. Access and using information ethically and legally

The survey was offered to 42 faculty; 17 responded. Of the 17, four identified themselves as interested in offering us more information about what they are doing in their classrooms or learning more about our group's goals. [As a result of the survey, two additional faculty were identified (1 Mechanical Engineering Technology, 1 Aviation Professional Pilot) who will collaborate with librarians next academic year.]

Cooperative Faculty/Collaborative Inservices in 2003-2004

<u>Discipline</u>	<u>Course</u>	<u>Faculty</u>
Engineering Technology	Mechanical Detailing First Year	Masuud Hassan
Science (Chemistry)	General Chemistry (UGE)	Jung Oh
English	Technical Writing	Judy Collins

(UGE refers Kansas State University undergraduate general education courses, designated to incorporate an active learning environment, an experiential context for whatever is studied, and an opportunity for students to connect ideas (<http://www.k-state.edu/catl/uge/>).

Developing online tutorials

Research has shown that faculty and students prefer the use of online materials when available¹⁶. To satisfy this preference, the library developed a series of online tutorial modules. The modules provide faculty and students with library assistance anytime, anywhere and allows them to learn skills at their own pace. K-State Online (<http://Online.ksu.edu>), an Internet based course delivery program, was selected as the means for tutorial delivery. The platform was selected over traditional web delivery because of its ability to track student usage and monitor their progress through the use of quizzes placed at the end of each module. To date, five modules incorporating fifteen lessons have been developed focusing on general library services, navigating the library's website, searching the card catalog, library database usage, topic selection, evaluating web sites, and differences in primary and secondary resources.

Section Guides

As a result of faculty collaboration, the library technology specialist developed section guides

for: civil and construction engineering technology, electronic engineering, technology, mechanical engineering, chemistry, and technical writing. The section guides are well-designed interfaces accessed from the library home page, always available online, and tailored to specific course needs to support IL. For example, the technical writing section guide simplifies the number of mouse-clicks required to bring students to databases in the programs served by the course. The technical writing section guide includes: general tips, types of research tools, additional tools to try, search tips, Salina resources, and main campus resources.

Helpful hints are provided in red type. The hints are derived from the content of the inservice visit, the activities modeled during the visit, and are helpful in performing the final assignment. In addition, the selection of databases are described, guiding students to select the most appropriate for the task they have been assigned.

The section guides include deep Internet databases subscribed to by the library (peer-reviewed, discipline-specific journal materials) as well as national librarian-developed guides to Internet sources in specific fields like aviation.

Planning of inservice materials and classroom visits

Technical Writing

A request was made by the Technical Writing instructor for the librarians to model methods of evaluating Web resources for students. A PowerPoint was developed that emphasized a four step method of web evaluation: credibility, accuracy, reasonableness, and support. The PowerPoint provided instructions on how to evaluate for the listed criteria as well as showing examples of good and bad web sites for each. This presentation was linked to the online course resources for students to access as needed throughout the semester, and was embedded in a major research/writing course assignment.

Chemistry

The librarians held several one-on-one meetings with the chemistry instructor to narrow down the specific research needs of chemistry students. It was concluded that two separate library inservices would be conducted to assist in research-oriented lab assignments. Interactive PowerPoints were developed that addressed the needs for each assignment. The first in-service dealt with library databases, topic selection and how not to get stuck in what the librarians termed as the “research box”. To get students to move beyond the exact research question given for the assignment, librarians showed students how to use critical thinking skills to brainstorm the topic and find avenues in which the topic related to areas of personal interest. The in-service provided guidance regarding how to effectively input the topic selected into library databases to maximize research results. Techniques included the use of Boolean operators, wildcards, and truncation.

The second library in-service shifted the focus to the World Wide Web and how it can effectively be used for chemistry research. A brief introduction to the Internet, the World Wide Web, web domains, and search engines was given as informational background. In addition, a real time comparison of the results produced by several search engines on a single topic was shown. This allowed students to see that not all search engines index the same material and that searching more than one engine is often beneficial. Students were introduced to the invisible

web and its ability to locate several subject specific databases that could not be found on the visible web. The PowerPoint closed with a warning of the dangers of information validity and a brief look at the steps involved in evaluating information on the World Wide Web.

Mechanical Engineering Technology

The IL skills required of mechanical engineering technology students is unique due to the applied nature of the degree. Librarians met with first-year mechanical engineering students to introduce them to the types of information resources they would be utilizing throughout their degree program. A majority of research in engineering occurs through the use of handbooks and Internet resources. Librarians prepared handouts that provided annotated bibliographies of several of the engineering handbooks available in the library. Students were also given a handout that walked them step-by-step through a search on the online library catalog. A subject directory of important engineering web sites as well as a comparison of search engines and their usefulness to engineering topics was also supplied.

The success of the library in-service with mechanical engineering students led to an additional in-service on the basics of patent searching. Librarians developed an interactive training session complete with a PowerPoint presentation and hands on learning exercises to satisfy this request. The presentation included a working definition for patent actually as well as definitions of the four components of intellectual property (copyright, trademark, patent and trade secret), the three types of patents (utility, design and plant). Statutory requirements and ownership issues were also discussed. Hands on exercises were conducted via the United States Copyright and Trademark Office patent database (<http://www.uspto.gov>). Exercises were developed to incorporate keyword, advanced, and patent number searches in addition to the Manual of Classification and United States Patent Classification Index.

Results

Library Use Survey

The results of the 2004 library use survey identified students enrolled in technical writing. (college-wide survey, N=334 without tech writing group, including faculty and students; tech writing survey, N=39). By comparing results of the survey between these two groups, the effects of the inservice visits to the tech writing course can be surmised:

Q: Do you use the 30 library computer workstations for any of the following (check all that apply)

	Tech Writing Students (N=39)	College overall (N=334)
Searching for items in a library catalog	48.7%	29.9%
Surfing the internet in general	76.9	60.5
Searching the internet for specific information	71.8	46.7
Working on class assignments	79.5	39.5

Table 2 : 2004 Survey of library use, comparing college overall to tech writing students

Tech writing students are sophomore standing or higher, and the course goals include IL

outcomes. Inservice visits are designed to support the achievement of IL outcomes. Table 2 reveals that tech writing students search for items in a library catalogue, surf the net for information significantly more than college-wide students. Tech writing students also report using the library to work on class assignments at a significantly higher rate than the college overall. While other courses across curriculum may contribute to these differences in library use preferences, this trend shows significant gains in library use.

In addition, as Table 3 below indicates, tech writing students show clear preference of databases as appropriate to their programs, the inservice visit information, and class instruction in IL. We would expect that the database, "Opposing Viewpoints" would be little-used by tech writing students compared to other databases, because these students are not writing arguments, but writing reports, proposals and studies in their fields. The Main campus resources refers to expanded database availability specific to engineering, aviation, business, and computing, which tech writing students used significantly more often than the college overall. Similar preferences are noted for the CQ Researcher, First Search, SIRS, and other databases, with Info Trac becoming the clear preference (92.3% tech writers, versus 58.1% college overall). While this preference may be influenced by database availability, we assume that the inservice visits instructing students in these databases have had an effect on preference. The next year's survey will isolate the issue of availability as a factor in preference.

Q: Which of the following electronic resources have you used in the past six months, either in the library or from another campus workstation?

	Tech Writing Students (N=39)	College overall (N=334)
KSU Salina library catalogue	53.8%	29%
Other library catalogues	23.1	6.9
*Opposing Viewpoints	46.2	48.2
Librarians Index to the Internet	66.7	10.2
Main campus resources	61.5	28.4
Info Trac	92.3	58.1
CQ Researcher	66.7	39.8
Issues and Controversies	33.3	44.6
OCLC FirstSearch	59	45.8
SIRS Discoverer	25.6	5.1
Other databases	25.6	6.9

Table 3: : 2004 Survey of library use, comparing database use

Faculty Survey (Appendix B)

The IL Group composed an informal survey in the spring of 2004, asking eight questions based on ALA IL outcomes. Surveys were designed to be confidential, and clearance was obtained from Kansas State University IRB board.

Of 20 faculty who responded to the survey, 17 assign some form of information-retrieval in their courses (see appendix B for course list).

Librarians are not often consulted by faculty when planning IL instruction:

Questions 3,4,5, only 25 % of responding faculty arrange for librarians to assist with instruction in (Q3) accessing needed information effectively, (Q4) evaluating information and its sources critically. (Q5) only 10% arrange for librarians to give instruction for incorporating selected information into one's knowledge base (although 55% report providing this instruction themselves). While faculty may believe they are saving librarian time and resources, the librarians prefer to be involved with faculty in these ILs, primarily to assure that faculty are current in *their* knowledge of available library resources.

Very few students are offered opportunities to determine the need for information (problem-based learning).

Question 2, only 30% of responding faculty (or 6 of 70 COTA faculty) have students determine the extent of information needed. (Some by developing guiding questions for research (Expository Writing and Technical Writing faculty). Yet, without achieving this ALA outcome, our students cannot solve problems or participate in problem-based learning activity.

Over half of students are not asked to evaluate information in their assignments

Question 4, only 45% of responding faculty instruct students in evaluating information and its sources critically.

Most students are instructed in using information ethically and legally

Question 8, 75% of faculty are instructing students in avoiding plagiarism and practicing ethical uses of information.

Inservice Visits*Technical Writing Inservice Visits*

The English faculty offered pre-inservice quizzes in 2002 asking students to research a question about a current problem or issue in their field. After students finished the exercise, she offered a survey asking whether students had used the Internet, the subscription library databases (deep Internet), or both. Only one student of 22 had used the deep Internet. The majority of students reported that they didn't know how to use the deep Internet (referred to as library databases).

The English faculty had (since 1996) asked students to evaluate Internet information for a diversity of writing courses at the undergraduate level, using the CARS criteria (Credibility, Authorship, Reliability, and Support). In her experience, students were naive about questions of authorship, domain, and publishing body, making it difficult for them to evaluate the quality of information retrieved in a typical Google search.

As a result of participating in the IL Group, English faculty revised course goals in technical writing to include specific IL outcomes, and developed a two-part assignment for 5% of the course grade in that asked students (a) to evaluate a web site provided by the instructor, and (b) to develop a five-source bibliography drawn from the deep Internet, answering a question posed by the instructor, in APA format.

This two-part sequence, in addition to a major, research/writing project (50% of course grade), meets several ALA outcomes for Aviation, Engineering Technology, Computer Systems

Technology, and Technology Management students. (See Appendix for a table keying the major technical writing assignment to ALA IL outcomes).

	Assignment: Evaluating a web site	Assignment: Composing a bibliography
IL skills required to complete the assignment	Use the criteria of CARS to assess the credibility of a given web site	Given a question (i.e. are contrails harmful to humans?), search the deep Internet to provide an answer or frame the debate.
ALA Outcomes:	Evaluate Information	retrieve information, implement and revise search strategy.

Table 4: Technical Writing Assignments and Information Literacy

In addition to the two-part assignment sequence, a written report correlates with ALA objectives:

American Library Association Objective	Technical Writing Assignment
Determine the need for information	Students select a topic from a their major, identifying a problem or need in their field, or a decision needing to be made. Students identify and audience, rhetorical purpose, and define the need for information from that context.
Access needed information effectively and efficiently	Students begin research (with guidance) searching for answers to their readers' needs and identify appropriate discipline-specific databases
Evaluate critically the sources of information.	Research Planning. Students compose an annotated bibliography as they plan for writing their Technical Background Report.
Incorporate information into knowledge base and value Accessing and using information ethically, without plagiarism	Students learn appropriate citation conventions, study the Honor Pledge, Academic Honesty, and report on Internet plagiarism.

Table 5: Correlation of Technical Writing Major Assignment with ALA IL Objectives

After the library inservice visits and implementation of the two-part assignment sequence, the English faculty saw significant improvement in students' ability to assess authorship, and plans to archive selected materials for course assessment purposes.

Criteria such as publishing body, accuracy, and reliability are more difficult for students to assess without discipline-specific guidance. For example, Aviation students consult the FAA site routinely to update themselves on the most recent advisories. Yet, as a publishing body, there are issues for which the FAA would not be the most unbiased source of information.

Chemistry Inservice Visits

Library inservice visits help students understand and acquire IL skills and are arranged before asking students to research specific content based information.

- The first assignment in the general chemistry course is a pre-lab assignment for open-ended, inquiry lab on “chromatography”. Students are asked to search for information using either databases or the Internet to write a summary report and to describe their search path and time spent in addition to content summary.
- The Second assignment is to get information on chemicals in everyday consumer products. Students are asked to investigate properties and functions of active ingredient chemicals using reliable informative sources. In addition to chemical name, formula, structure, and properties, major uses and applications, students are asked to evaluate benefits and precautions based on information from reliable organizations and peer reviewed scientific journals.
- The third assignment is to research information about a chemical element in the periodic table. Students are asked to present a concise representation of an element in a 4 inch by 4 inch space and to convey information about the element in creative manner, using their choice of media (e.g. video clips, power point presentation, and etc.)

Outcomes of library Inservice visits are rewarding. A question related to Boolean operators was asked in a chemistry exam after the Inservice visit in Spring 2004; all except one student answered correctly. Even with limited data, students’ own responses on their pre-lab assignment on “chromatography” are compared: students, with library In-service participation in Spring 2004, listed average 4.2 references and indicated 2.9 hrs time spent on the assignment. In comparison, students in Spring 2003 reported 3.2 references and Spring 2002 listed average 1.5 hrs.

The chemistry faculty observed noticeable improvement in the quality of students’ ability to assess and evaluate information with library Inservice visits. When students are asked at the end-of-semester survey, 44 % strongly agreed or agreed that “Library Inservice lectures on database and advanced Internet search were beneficial” and 27 % indicated neutral. With a statement, “Class periods designated for library lectures for IL were worthwhile”, 45 % strongly agreed or agreed and 32 % indicated neutral. The chemistry faculty’s conviction to be a collaborator with librarians in teaching IL skills in content based science course got stronger.

Mechanical Engineering Inservice Visits

An interview with Masuud Hassan revealed that his experience with tailored inservice visits was positive. His first year students could not identify library resources relevant to their mechanical detailing projects, so Hassan had been providing them with the references. The library inservice seems to work with one visit, a 2 to 3 hour session in the library. Students write reports on what they did in the lab, citing and listing all sources used to help conduct the lab. Students were required to identify two or three resources with similar materials, and one class period was given for them to present this information to the large class.

This year, 2004, Alysia introduced the patent search process to mechanical engineering students in Hassan's course, and he believes it is important that they learn this early in the engineering program.

Discussion

The activities of the librarians described in this study are diverse, responding to the specific needs of divergent content areas (mechanical engineering, chemistry, expository writing). We learned that the quality of interaction among faculty and librarians is essential to the successful tailoring of IL instruction to course and curriculum needs. The librarians listened carefully to faculty goals, developed materials and inservice plans, and then followed up with faculty to learn about how the instruction worked from students' perspectives.

On the other hand, faculty were willing to learn new integration strategies for adding IL to their curricula. These attitudes were key elements in achieving positive outcomes.

We found in the IL Group that a sense of learning community led us to the benefits of collaboration: all faculty have found the Inservice visits to be effective, and students who were surveyed have valued their experiences.

From the beginnings described in this paper, the IL Group's awareness has grown, regarding the potential fluency divide in the students we teach. With a clearer understanding of what it means to be a fluent user of information, our interactive collaboration has been very productive. As an ad hoc learning community of four, we are discovering the breadth and complexity of assessing IL at our institution.

We are also left with many questions for further investigation, such as, where will scientists and engineers develop the IL skills they will need on the job? What are the outcomes for faculty as well as students associated with IL? If this transformative movement proceeds, those who are involved in the process might consider, from the faculty perspective, how to document

- Curriculum transformation
- Development of new teaching methods
- Inclusion of new perspectives in curricular planning
- Development of new scholarship
- Enhancement of the classroom community
- Faculty incentives associated with IL: tenure, promotion, salary bonus, reduced teaching load, faculty development, travel funds, enhanced sense of interpersonal competence, facilitating a sense of community at the institution, identification of new research topics, facilitation competencies among faculty and students
- A collective, more integrated process for achieving IL outcomes

By embracing the teaching opportunities that IL provides, we can better prepare our graduates for the future, and in the process, assist librarians as they assume higher-profile roles in the teaching of information literacy. Effective faculty/librarian collaboration can bridge the emerging fluency divide in our students, and prepare them to participate in the democratic processes and knowledge capabilities of the new economy.

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