
Integrating Information Literacy into the Virtual University: A Course Model

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ABSTRACT

THE VIRTUAL UNIVERSITY ENVIRONMENT provides librarians with new opportunities to contribute to the educational process. Building on the success of team-teaching a traditional liberal arts core course with composition and communications faculty, librarians and a communications professor worked together to integrate the Association of College & Research Libraries (ACRL) *Information Literacy Competency Standards for Higher Education* (2000) into the online environment. The resulting graduate-level course in multimedia literacy assembled faculty and curriculum resources normally untapped in traditional classrooms. All five information literacy standards covering need, access, evaluation, use and the social, economic, legal, and ethical issues surrounding information use were addressed. Readings and threaded discussions about intellectual property, fair use of copyrighted materials, the evaluation of free and fee-based Web information and Web page design and construction prepared students to work in groups to design and construct Web sites. Students also completed a capstone project in the form of individual Web portfolios, which demonstrated the information and multimedia principles they learned in the class. Assessment of information literacy skills occurred through the analysis of student discussion, evaluative annotations, Web site assignments, perception surveys, and a master's level comprehensive exam question. What was learned in this course will serve as a model for future collaborative partnerships in which faculty and librarians work together to ensure that students who learn from a distance truly master information literacy competencies.

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INTRODUCTION

Increased access to technology has altered the way that students study, while the variety of electronic information resources has widened the potential resource base for all students. These developments have reduced face-to-face teaching in the library and the need to visit the library building for help. It has also meant that librarians need to alter the way they plan and deliver information literacy instruction. (Orr, Appleton, & Wallin, 2001, p. 457)

User expectations regarding electronic access to information are increasing. Academic library collections are evolving from primarily print-based collections to growing electronic collections. Universities are offering more and more distance education courses. As a result, library services, including user education, must evolve to meet new user expectations in the virtual university environment.

According to Saunders (1999), “partnerships with teachers are more necessary in the virtual library than ever before to design learning experiences that require multiple formats and critical thinking” (Users’ Expectations section, para. 4). Although librarians have a long history of collaboration with faculty, the successful integration of the new Association of College & Research Libraries (ACRL) *Information Literacy Competency Standards for Higher Education* (2000) into college and university curricula depends on forming even closer partnerships with faculty. A newer type of partnership, which is likely to increase in the years to come, is the development and team-teaching of online courses by librarian-faculty teams. Integrating information literacy (IL) into online courses will help students become more aware of the issues surrounding information and its use. This article describes the development, teaching and assessment of an online course in which IL learning outcomes are integrated with course content.

During Fall 2001, two Austin Peay State University (APSU) librarians teamed with a communications professor to develop and teach an online graduate course in communications topics entitled *Multimedia Literacy*. In order to place this course into context, this paper will first discuss the role of librarians in the virtual university environment. Next, it will consider the importance of instructional design and librarian-faculty collaboration to the integration of IL learning outcomes into the virtual university. Within this broader context are descriptions of APSU librarian-faculty collaboration and the APSU Library User Education Program. The paper then discusses how this particular graduate multimedia literacy course was conceived, developed, and taught. It addresses the integration and assessment of IL student learning outcomes with course content. The final sections of the paper include student feedback, as well as the instructors’ observations and recommendations concerning the integration of IL into online courses.

The Virtual University Environment: Background

The College and University Systems Exchange (CAUSE) Current Issues Committee (1997) defines a virtual university as “an institution, or a set of institutions, engaged in a delivery of degree granting programs in higher education, using technology and methodology outside a traditional classroom” (Virtual Universities section, para. 1). Over 2 million college students will be engaged in distance learning by 2002, according to a January 1999 International Data Corporation report titled *Online distance learning in higher education, 1998–2002* (as cited in Distance Learning in Higher Education, 1999, Expanding Universe section, para. 1). The report concludes that 84 percent of four-year colleges and universities and 85 percent of two-year colleges will offer distance education courses in 2002. Given these numbers, it is imperative that librarians seek additional ways to meet the needs of distance learners. As Hricko (2001) points out, “students that have a greater intellectual framework for using information will most likely be the individuals that have the greatest success in completing distributing [*sic*] learning courses” (para. 2).

Librarians and the Virtual University

Library gate counts are decreasing (Carlson, 2001), which comes as no surprise to librarians. More and more students are visiting library Web sites, or simply bypassing the library altogether. When students do use the library in addition to the general Internet, they expect Internet-based services such as online public access catalogs, full-text database articles accessed via the Web, and e-reserves. Libraries try to meet these expectations by providing growing numbers of materials electronically, document delivery via Ariel and other services, such as Ingenta, for faster access to materials not held locally. More databases, more full-text articles, and more electronic books are making research possible anytime, anywhere. Remote patron authentication, which enables users to access library services from anywhere in the world, is now in place. Martell (2000) suggests that, in the future, “librarians will deal with users almost exclusively in a virtual environment and face-to-face interchanges will become atypical” (p. 104). Librarians are hard at work constructing well-designed Web sites and answering live chat and e-mail reference questions. However, providing access to needed resources and answering reference questions is only part of the equation. Librarians also need to instruct users about the variety of resources available to them both on the World Wide Web and through library Web sites, as well as about the differences among the various types of resources that they need. Derlin and Erazo (1997) state that “teaching patrons how to effectively apply the increasingly sophisticated search methods available online will be an important function in the digital library” (p. 105). Because users are accessing library Web sites rather than visiting library buildings, librarians need to consider new ways to design instruction for distance learners. In order

to capitalize on the unique opportunities and challenges present when teaching IL in the online environment, librarians need to absorb and apply current instructional design principles.

Instructional Design in an Online Environment

Good pedagogical elements, such as clear educational objectives, assignment-specific instruction, and active learning, have served librarians well through the years. These elements continue to provide the basis for effective instruction in the online environment (Dewald, 1999a). However, additional design considerations emerge as IL instruction for distance learners evolves. Although an in-depth discussion of design principles is beyond the scope of this article, a few questions to consider when planning online instruction are:

- How much do instructors and students know about the technology they will need to use in the online environment?
- What are the limits imposed by the technology that students and instructors are using?
- How do instructors ensure that sound teaching relationships with students are built in the online environment?
- What is the most effective delivery method to convey information and create a learning opportunity in any given situation, given the different ways to interact with students online?
- How can the distinctiveness of the online environment be maximized to motivate students to learn?
- What ways can the online environment be used to capitalize on the unique strengths of the independent adult learner?
- What methods can be used to assess students in the online environment?

Consideration of these issues will enable librarians to plan effective IL instruction in the online environment (Dewald, Scholz-Crane, Booth & Levine, 2000; Dewald, 1999b).

Meeting Student Information Literacy Learning Outcomes

Grassian and Kaplowitz (2001) state that “synchronous remote learning and particularly Web-based asynchronous learning allow us to reach out to a larger variety of user groups by offering various forms of ILI [information literacy instruction] in learner-centered approaches” (p. 408). “Information literacy in a distance learning environment can be provided through credit courses taught by a librarian, as an integrated component of a discipline-based distance education course, or as stand-alone Web tutorials” (Dewald et al., 2000, p. 37). Librarians have experimented with stand-alone IL courses and tutorials for several years now (e.g., Fowler & Dupuis, 2000; Hansen & Lombardo, 1997; Manuel, 2001; Parise, 1998; also see *Contours of Cyberspace*, 1999; *Go for the Gold*, n.d.; and *Information Literacy & You*, 1999). Most recently, O’Hanlon (2001) reports the development of a four-

week online freshmen IL course, “the first credit course in research skills offered by the libraries. . .” (p. 9) at Ohio State University. The award-winning Texas Information Literacy Tutorial (TILT) is now available for use by other libraries through an Open Publication License (Dupuis, 2001). Such examples demonstrate growing experiences among librarians who use technology to teach IL concepts asynchronously. Iannuzzi (1998) believes librarians can capitalize on such experiences to form new partnerships with faculty. Additional ways to deliver IL instruction, including the integration of IL within distance education courses, must be developed. Fully integrating IL learning outcomes into distance courses will require librarians to build even stronger collaborative relationships with faculty in the future.

Collaboration between Librarians and Faculty

Partnerships have always been an important means of informing users about the information resources and services available to them (Raspa & Ward, 2000). However, the evolving nature of higher education demands new types of collaboration, especially in the areas of distance learning and technology. Rader (1998) states “librarians are emerging within the university as leaders in the electronic information environment where new formats of information and knowledge are beginning to have an impact on learning, teaching and to some extent research” (Academic Libraries at the Cross-Roads section, para. 2). She believes (1996) that “[librarians] must forge partnerships. . . to bring about curricular restructuring and dynamic learning environments for students in the information age” (Librarian-Teacher Partnerships section, para. 1). Iannuzzi (1998) advocates involvement in key campus initiatives, such as technology in the classroom and distance learning.

“Distance education also presents a host of unique collaboration opportunities and challenges” (Caspers & Lenn, 2000, p. 150). The virtual university allows librarians to be “present” and involved in online courses on a scale not always possible in a traditional classroom. However, distance learners may not have the advantage of an informal peer network to familiarize them with library resources. Therefore, to be effective, librarians must “reach distance learners. . . through cooperation (at least) and collaboration (at best) with teaching faculty” (Caspers & Lenn, 2000, p. 150). Examples of cooperative activities are:

- Creating distance education resources and services Web pages;
- Advocating links to Library Web sites within online courses; and
- Developing course-specific resource Web pages.

Hricko (2001) believes that “in order for remote access students to develop information skills, librarians should collaborate with distance educators to develop Web-based assignments that lead students to master the basic competencies of information literacy” (para. 4). This collaboration

will extend further, in some cases, to librarians and faculty working together to create course-integrated units and modules, as well as to develop and team-teach online courses. Collaborating more directly with faculty will ensure that IL is integrated to the greatest degree possible with course content. As Hodson-Carlton and Dorner (1999) observe, “a *collaborative redesign* [italics added] of the instructional module for Internet delivery could increase the relevance of the exercises to the student’s clinical practice areas and promote more student interaction with the material” (p. 22), an idea they later pursued with success (Dorner, Taylor, & Hodson-Carlton, 2001).

Referring to online course-integrated IL instruction, Dewald et al. (2000) point out that “although such activities may be labor-intensive for librarians, collaboration with faculty can be rewarding, and there will probably be more such examples in the future” (p. 38). If librarians and faculty collaborate to include IL concepts with course content, it is more likely that students will achieve IL learning outcomes.

The remainder of this article will discuss the collaboration between librarians and faculty to develop and teach an online course at Austin Peay State University (APSU). First, background information about APSU, ongoing collaborations between librarians and faculty, and the APSU Library User Education Program will place the course in perspective.

AUSTIN PEAY STATE UNIVERSITY: OVERVIEW

Austin Peay State University (APSU), Tennessee’s designated public comprehensive liberal arts university, is located in urban Clarksville (pop. 103,000), forty-five miles northwest of the state capital, Nashville. Its educational emphases are liberal arts and professional programs such as education and nursing. Librarians team-teach with faculty as part of APSU’s Heritage Program, an alternative core of interdisciplinary freshman English and humanities courses. Two interdisciplinary courses in writing, speaking, and researching have been offered to freshman students for the past fourteen years at APSU.

APSU’s 7,500 students include many part-time (38 percent), nontraditional (52 percent), and distance education (36 percent) students. It is also largely a commuter campus, with only 1,000 residential students (E. Ivey, director of institutional research, personal communication, November 10, 1999; T. Moseley, distance education coordinator, personal communication, March 5, 2002). Given such characteristics, offering online courses is a logical delivery mode. Online courses began at APSU in Fall 2000 with three courses and thirty-eight students. With support from a new administration, online course offerings have grown to forty-nine courses, enrolling 1140 students, in Spring 2002.

APSU is a Tennessee Board of Regents (TBR) institution and also supports the Regents’ Online Degree Program (RODP), a completely online degree program in which courses are provided through all the TBR uni-

versities and colleges. APSU faculty taught five RODP courses in Spring 2002 (T. Moseley, personal communication, March 5, 2002).

Relationships between APSU Librarians and Faculty

Through the years, APSU librarians have consistently provided leadership in bringing technology to campus and integrating it into the teaching and learning processes. Librarians, in cooperation with faculty and staff, have taught Internet courses, and have led and served on technology committees. As individuals they have served in key campus roles such as academic advisors; the university's first Webmaster was a librarian. In many ways, these efforts have laid the foundation for instructional collaboration with APSU faculty, a very high priority for APSU librarians.

Along with the partnerships linked directly to the library user education program described below, librarians are currently working with distance education staff and faculty experienced with technology to establish a multimedia development suite. This facility is housed in the library and coordinated by a librarian who is also involved in the library user education program. The suite will provide a place where faculty can learn about instructional design in an online environment and how to integrate multimedia into the courses they teach. It will also provide additional opportunities for librarians to work with faculty to integrate appropriate IL concepts into the curriculum.

The Library User Education Program

In 1986, the APSU Woodward Library User Education Program was formalized with the hiring of a user education librarian. The program provides course-related instruction (85 percent), course-integrated instruction (12 percent), and orientations (3 percent). Between 1986–87 and 2000–01, the number of instruction sessions grew from 57 to 131, representing a 130 percent increase. A new surge is presently occurring, with Fall 2001 sessions (100) outpacing Fall 2000 sessions (76) by 32 percent. The number of students reached has increased by 153 percent in the past fifteen years.

During the 1990s, the user education program evolved as the library integrated additional electronic resources and technologies. An instructional facility in which students engage in active learning experiences was built in 1994. Instruction was established as an integral goal within the library's strategic plan; all librarians are now encouraged to become involved in instruction. The library's distance education services, "Ask A Librarian" (e-mail/live chat reference), and Web site all reinforce the library's instructional mission.

The APSU library Web site, <http://library.apsu.edu>, provides a means to reach students anytime, anywhere. Librarians post instructional materials directly to the Web site so that distance learners have access to help at their points of need. Research guides, search tips and information about how to use specific resources and services are examples of instructional

materials that have been developed by librarians, who do so in anticipation of learners' needs and in response to their requests.

The potential for IL instruction within the more formal online learning environment is great. APSU librarians have already been asked to create course-specific resource Web pages and Web-based instructional units. Faculty can then link to these Web pages from within their departmental or personal Web pages, or from within their online courses developed in the more controlled Blackboard and WebCT environments. They have also worked closely with the director of distance education and the Blackboard administrator to make sure clear links to the library's Web site are visible within the online environment. In order to fully integrate IL concepts within course content, however, APSU librarians need to work more directly with the faculty who are teaching the courses. Fortunately, librarians have already established relationships with a number of faculty members. One such relationship continues to open doors.

During the last fourteen years, librarians have worked closely with composition and communications faculty first to develop two Heritage Program courses (HUM 1010 and 1020) on "Writing, Speaking, and Researching across the Curriculum," and second, to team-teach the courses. Through the years, experiences with Heritage course-integrated library instruction have heavily influenced the instruction provided in course-related sessions requested by faculty teaching other courses. Overall, relationships between faculty and librarians are stronger as a result.

During April-May 2001, selected APSU faculty, including one of the Heritage communications professors, met with librarians in information literacy initiative meetings which grew out of an action plan the user education librarian developed during an ACRL Institute for Information Literacy Immersion Program. In Summer 2001, HUM 1010 was revamped to focus on specific IL learning outcomes, which were being assessed as part of the national IMLS/ACRL "Assessing Student Learning Outcomes in Information Literacy: Training Academic Librarians" project. As a result of all these activities, both the librarians and the communications professor possess a greater understanding of IL learning outcomes, as well as having the experience of working together. The timing was right for collaboration on a new venture, namely an online multimedia literacy course.

MULTIMEDIA LITERACY ONLINE COURSE: BACKGROUND

The APSU communication and theatre department offers the master's in communication arts degree with a corporate communication specialization. One elective available within this degree program is "Topics in Communication" (COMM 5900), in which "research, discussion, and papers focus on a variety of communication topics related to media and organizations" (The Master's in Communication Arts, n.d.). "Multimedia Literacy" was selected as the COMM 5900 course topic scheduled to be

taught online during fall semester 2001. The original topic area, outlined by a faculty member who has since left the university, included "defining multimedia, exploring its use, and discussing the impact its growth has on society. . . . [to] provide a multimedia toolbox, demonstrate how to create and publish multimedia applications, and introduce the World Wide Web and how to create Web pages. . . . [encouraging] discussion of multimedia frontiers, emerging technology, and societal issues including human impact, regulation copyright, fair use, equity, cost, and universal access" (On-Line Courses, n.d.).

At the end of spring semester 2001, the chair of the department of communication and theatre asked the communications professor who would eventually serve as chief instructor for the course to investigate options for developing and teaching the course. Based on previous work in Heritage and the newly organized information literacy initiative, the professor saw connections between multimedia literacy and IL. He believed that this course might be a vehicle through which to integrate IL into the graduate communication program. He approached library faculty for assistance, and they readily agreed to collaborate on the course.

All three instructors brought valuable experiences to the development table.

The communications professor (chief instructor) had worked in distance education while completing his doctorate and had coauthored an article on the virtual university environment (Turner & Jones, 1994). The librarian guiding the integration of IL into the course serves as user education librarian and designs Heritage 1010 IL instruction and assessment. The librarian overseeing the Web design and construction portion of the course serves as the library's Webmaster and teaches in the Heritage Program. All three instructors received training from the APSU Blackboard administrator and were somewhat familiar with the Blackboard environment.

The chief instructor envisioned a course that would give students access, evaluation, and application skills for using the World Wide Web. Students would build their own Web sites using what they had learned about finding and evaluating content. The Web sites were to be driven by the individuals' areas of academic interest and focus. Students would learn about Web authoring tools, Web page design strategies, organization, and whatever else would help them to place materials in the Web environment.

The user education librarian was interested in focusing on more advanced IL competencies, such as the "IL Standard Five," which cover the legal, economic, ethical, and social issues surrounding the access and use of information (Association of College and Research Libraries, 2000). Helping students examine ethical issues and information technology in libraries, as Bodi (1998) suggests librarians can and should do whenever possible, was very appealing. In addition, tying evaluation and use of Web sites as information sources to Web site design and construction was an

interesting prospect. Much would depend on how information-literate the graduate students already were.

The library's Webmaster viewed the Web as the most pervasive multimedia environment in today's society. However, librarians' skills, such as organizing information, are very important and somewhat lacking on the Web. Web design could potentially be used to teach some underlying information skills. The Webmaster drew parallels between potential course content and the library Web site redesign process that APSU librarians had just completed. This process included setting goals, brainstorming about content, and experimenting with organization. Students could learn to concentrate on the important issues of content and organization by:

- Comparing easy-to-use and hard-to-use sites and identifying the aspects that made the sites that way;
- Creating a target audience and goals for a Web site;
- Listing the content to be included in the Web site;
- Organizing the content;
- Developing a navigation scheme; and
- Creating homepages and a few linked pages.

Instructors spent summer 2001 separately considering content, discussion questions, and assignments that would allow students to interact with and learn the material. A rough outline of the course was drafted following a face-to-face meeting of instructors at the end of July 2001. Shortly after this meeting, an English professor working for a nearby university offered his manuscript of a basic Web portfolio textbook for students to use (beta-test) as a guide in their work. While initial development of the twelve-week course occurred during August 2001, the instructors found it necessary to remain flexible and open to needed changes throughout the course, which ran from September through November 2001.

Course Development and Implementation

The challenge of developing this course for delivery in an online environment soon became apparent to those involved. Questions concerning appropriate course materials, student experience, and the online environment had to be considered:

- What course documents would be used? Would a separate print text be most appropriate? Would Web-based readings be available?
- Had all enrolled students already completed at least one online course? Had they completed at least one graduate course? Did they hold a bachelor's communications degree?
- Could this course's learning objectives be accomplished in Blackboard?

The chief instructor realized that a new conceptualization of multimedia literacy was necessary and began with a definition. The following defini-

tion is based on a synthesis of the definitions of *literacy*, *visual literacy*, and *multimedia* (Lexico LLC, 2002). Multimedia literacy is "having the knowledge or competence needed to recognize and understand ideas conveyed through various media" (Jones, Luck & Buchanan, 2002, Collaborating Online to Teach section, para. 10). This new definition freed the instructors to focus on multimedia concepts and ideas rather than software tutorials and labs. Enabling students to acquire a broad knowledge of what works and what does not work in multimedia environments was deemed the most appropriate course objective. Instructional strategies that would ground students in information and multimedia concepts and ideas, as well as provide them with some practical experiences in which to apply the concepts, emerged.

Given the fact that the course was being delivered online via the World Wide Web, students could use the Web to explore concepts of information and multimedia literacy. In place of a single text, instructors identified course content readings freely available on the Web, via the library's Web-based databases or through electronic reserves, and provided links to them within the Blackboard environment. Instructors created weekly course overviews that guided students in completing course readings, answering threaded discussion questions, and writing essays. Students also were required to design and construct group Web sites and compile individual Web portfolios in which they collected written and multimedia examples of their own work and supporting materials. Throughout all of their work, students gained in IL competencies, which enhanced their ability to complete the assigned work.

Information Literacy Outcomes Addressed

Selected student learning outcomes associated with the ACRL *Information Literacy Competency Standards for Higher Education* (2000) were addressed throughout the multimedia literacy course. The ACRL Instruction Section's (IS) *Objectives for Information Literacy Instruction: A Model Statement for Academic Librarians* (2001) was used in conjunction with the ACRL *Standards* to pinpoint specific *objectives* related to the IL student learning outcomes. Although later units reinforced IL outcomes as well, two initial IL units offered during the second and third weeks of the course focused specifically on information literacy content.

The course overview for the first IL unit (week two) began by emphasizing the students' need to develop topics to cover in their Web sites and Web portfolios. This first unit then covered nearly all of the student learning outcomes (and the specific IS *Objectives*) associated with IL Standard Five: *The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.*

During that week, students were required to read Web-based sources about the issues surrounding information access and use, as well as review

plagiarism and the ethical use of information. The selected legal, economic, and social issues included:

- Intellectual property and fair use of copyrighted materials;
- Free access to information, libraries and censorship; and
- Free vs. fee-based access to information.

Students reacted to the readings through threaded discussions. The discussion questions (see examples below) prompted students to critically think about issues.

- Do you think the author is correct in her premise that the value of information will shift from the creation of content to the services associated with that content?
- How do you think creators of information content should approach their work in the future?
- As you research your multimedia topics, how much information do you think you will find in the free area of the World Wide Web?

The second IL unit (week three) guided students through the process of accessing and evaluating information. Students were assigned readings covering the standard evaluative criteria (authority, accuracy, currency, coverage, and objectivity); they reacted to these readings by participating in threaded discussions in response to posted questions. In some cases, student discussion indicated that they already employed standard criteria. However, it was also clear that the readings and discussion with their classmates added to their knowledge base and experiences. For example, students responded to the question, "What has been your experience with the quality of Web-based information compared to print information sources such as journal articles and books?", by stating that they believed Web-based information was more accessible, more understandable, and the quality comparable in some cases. At the same time, they also pointed out that the Web held too much information, the accuracy was questionable, and the library's Web-based databases were better than the free Web information.

Instructor feedback was a synthesis of student discussion, but also included additional points that needed to be made. For example, in response to student comments about fee-based and free Web information sources, the IL instructor pointed out that libraries must shift from ownership of sources to providing access to sources because information volume and cost are increasing while library funding is decreasing.

Students put into practice what they learned about accessing and evaluating information by identifying three information sources pertaining to their upcoming Web site group project. They then critically examined the sources and wrote source annotations utilizing the standard evaluative criteria (*critical thinking skills*). [Note: Selected taxonomies (skills) are highlighted throughout this section. They receive additional consideration in

the discussion on assessment at the end of the section.] The second unit addressed selected outcomes relating to IL Standards One (*information need*), Two (*access*), and Three (*evaluation*). The main IS *objectives* associated with the IL outcomes addressed covered:

- Focusing on a project topic;
- Using technology to organize information;
- Understanding the differences between free and fee-based sources;
- Modifying the search according to information found;
- Conducting the search in different retrieval systems;
- Using the Library's Web site to identify information about services; and
- Evaluating information based on standard criteria.

In an effort to prepare students for the next course segment, two final threaded discussion questions regarding evaluation of Web sites included:

- How well do you think these Web pages (required readings) conveyed the information about evaluating information sources?
- How will you use what you learned this week in designing your portfolio?—In other words, what might you do differently to ensure others will evaluate your site favorably?

Objectives reached in the second and third weeks were further exercised during the next five weeks as students searched for information while they learned how to present multimedia in the Web environment. Outcomes associated with IL Standard Four (*The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose*) received the most attention during this segment of the course as students focused on using information in an electronic environment rather than in a research paper. Students learned about Web site design and construction, which involved:

- Understanding basic design principles;
- Defining the project;
- Planning organization and navigation;
- Creating a Web site blueprint; and
- Developing Web page content.

Throughout this segment, they learned how to gather, evaluate, and organize information from outside sources, as well as to draw upon their own knowledge and experiences.

Web design readings and threaded discussion questions made the students consciously think about how they themselves use the Web. Some of their responses to the discussion questions posted during the course's middle weeks demonstrated that they had achieved the objectives that were the focus of weeks two and three. For example, one student's response to a question about Web design mistakes was, "I like to know where my information is coming

from so I can determine if it is reliable.” Yet another student responded, “I also strongly agree that [having] no. . . [biographies] is a big problem and I hate when it is not recorded when the information was updated.”

Using their own experiences and the evaluation criteria previously learned as a starting point, the students looked at the flip side: which design and management principles create a good user experience and good evaluation. Students were asked to evaluate “good” and “bad” Web sites. In the case of the “bad” Web sites, they identified solutions to the Web sites’ problems (*problem-solving skills*). They viewed the Web sites using the Lynx text-based browser, which not only allowed them to experience the frustration of visually impaired users dealing with bad HTML, but also reinforced the value, or lack thereof, of multimedia elements. Viewing a Web site through the Lynx text-based browser introduced *disequilibrium*, an active learning method that Oberman (1991) advocates because, “the mental discomfort of disequilibrium challenges students to think actively and constructively. . . . remembering what they discovered and transferring the principle to a new problem” (pp. 198–199).

Visualizing the organization of Web sites helped students become more efficient at accessing information through the Web. Engaging in the process of creating a Web site helped students better understand the medium. Overall, students gained skills in “synthesizing course content with their own prior knowledge and skills” (Dewald et al., 2000, p. 40) during the Web design segment of this course (*synthesis skills*).

During the last four weeks of the course, students created group Web sites, critically reviewed their peers’ Web sites and developed individual Web portfolios. Targeted IL competencies were visible within student work; for example, use of evaluative criteria came through in their peer reviews. Students also had the chance to reflect upon what they learned about information within their Web portfolios. The process of creating group Web sites and individual Web portfolios helped reinforce what students learned concerning evaluation and the issues surrounding information use. Oberman (1991) believes “the application stage ensures that the discovery of a concept or skill through group activity can be generalized to a new problem” (p. 200). Creating the Web sites and Web portfolios provided students with the opportunity to *apply* what they had learned about Web site design and construction (*application skills*). By the end of this segment, students had learned to:

- Work together;
- Share technical knowledge;
- Brainstorm and negotiate content and design; and
- Debate various points of view.

They presented information in a unique environment with its own rules, applied evaluative criteria to their own work, learned how to critical-

ly review their peers' work and responded to and revised their work based upon outside reviews.

The multimedia literacy course as a whole shows evidence of the process of building the important cognitive skills of analysis, synthesis, and evaluation (Oberman, 1991). Active learning elements within the context of the APSU course's activities are listed below in italics:

- Students engaged in *group activity* as they constructed Web sites.
- Instructor *reinforcement and feedback* occurred through discussion threads, via e-mail and within the Blackboard Course Material area.
- *Application* of IL competencies and Web site design and construction principles took place through the annotated bibliography, Web site, and Web portfolio assignments.
- *Equilibration* occurred as a result of the *disequilibrium* present within the course (e.g., the use of the Lynx text-based browser to view Web sites to determine their usability).

According to Oberman (1991), "Active teaching, which results in active learning [employing the four elements listed above], offers an opportunity for students to discover the concepts which they will need to operate in an information rich environment" (pp. 198–200). Technologies associated with distance education enabled instructors and students involved in this course to engage in active teaching and learning, and supported the processes needed to develop students' cognitive skills. The graduate students, who were all older, responded well to these active learning techniques as suggested by Dewald et al. (2000). As a result, student learning experiences were much richer.

Selected taxonomies, which Dewald et al. (2000) believe "may prove useful in selecting skills to assess" (p. 40), appear italicized below, as well as in previous sections. Students demonstrated their learning through:

- *Critical thinking skills*: Students developed evaluative skills by reading and discussing evaluative criteria, then applying them to information sources identified for their annotated bibliographies. They also used evaluative criteria to break down Web sites and assess the information they contained. Students also employed evaluative skills in their peer reviews; instructors gave feedback through discussion and comments on graded assignments.
- *Problem-solving skills*: Students used evaluative criteria to analyze "bad" Web sites and learned how to solve the problems they identified. They then took what they learned and applied it to their own Web site projects; instructors gave feedback through discussion and comments on graded assignments.
- *Synthesis skills*: Students synthesized course content about intellectual property and fair use of copyrighted materials with their own prior

knowledge. They incorporated this knowledge in their Web site and Web portfolio projects; instructors gave feedback through discussion and comments on graded assignments.

- *Application skills:* Students applied what they learned about information to creation of a Web portfolio that represented their academic, professional, or business work; instructors gave feedback through discussion and comments on graded assignments.

The assessment methods outlined above reflect the best characteristics Dewald et al. (2000) advocate and believe to be “crucial to the success of distance learning endeavors . . .” (p. 39). They include:

- Connecting to learning outcomes;
- Centering on the student;
- Assisting both teachers and learners; and
- Gauging progress throughout course, as well as at the end of the course.

Final assessment of student learning will occur after more students complete a master’s-level comprehensive exam question related to course content. A student perception survey provided immediate assessment information.

Student Perceptions

Students were given the opportunity to evaluate the course by means of an anonymous online survey. The sixteen survey items covered student demographic information (three items), grading (two items), materials (two items), course design (four items), and content (five items). Thirteen of fourteen students answered the survey, and ten students posted additional comments. Percentages quoted combine the “strongly agree” and “agree” responses. Remaining options were “neither agree nor disagree,” “disagree,” and “strongly disagree.”

Resulting feedback covering demographics, grading, and materials indicated:

- Most students had taken communications classes before (85 percent).
- Most students had taken a graduate course (62 percent).
- Over half were taking their first online class (54 percent).
- Nearly all found the assignments reasonable for a graduate-level course and the grading policy fair (92 percent).
- All students found the online readings appropriate and liked having materials provided online rather than through bought textbooks.

A large majority of students indicated they felt the class as a whole was appropriately designed for an online format (85 percent) and that the IL, Web site design and construction, and Web portfolio modules built well upon each other (69 percent). Most felt that having several instructors made

the course a richer experience than having only one instructor (77 percent). Although a few students found having three instructors “confusing” at times, others noted that “the different experiences and backgrounds of the instructors broadened the interpretation and . . . [delivery] of the material.”

In considering course content, nearly two-thirds of the class (61 percent) noted that the IL topics integrated well with what they had studied in other communications classes, although one noted that while “interesting and well thought out . . . [information literacy] could have been related better to the topic and not just library issues.” When asked if the approach to multimedia maximized what could be learned in an online class, students more readily agreed (77 percent). Most students felt that Web site group work provided interaction that might otherwise be missed in an online course; however, some raised logistical and task assignment concerns. Some students felt that it was difficult to get everyone in the group together. Another student felt that most of the work fell to the “expert” in the group. Students found the Web portfolio component a logical extension to what had been learned in the first two units on IL and multimedia design and organization (77 percent): “The coursework for this class led nicely to the final project. It made the final project easier to do, knowing all the material we had covered previously.” However, several students made appeals to “[b]egin reading the Web Portfolio book [online text manuscript] at the beginning of the semester. It would have been helpful in choosing our topics . . . [and] building . . . [the] group Web sites.” Most students felt that the assignments built on each other (61 percent), but all agreed that the information in the class was practical (100 percent). Course instructors plan to use the information obtained from students to improve this course.

Instructor Observations and Recommendations

Team-teaching a course with classroom faculty provides librarians with an exciting opportunity to truly integrate IL into the students’ education. The goal is for librarians and teaching faculty to “contribute to these skills in a mutually reinforcing manner” (Dewald et al., 2000, p.33). The APSU multimedia literacy course successfully integrated some IL standards; however it also revealed the following challenges which need to be addressed further:

- Librarians, in collaboration with faculty, need to develop workable, mature methods for integrating IL concepts into traditional coursework and assignments instead of teaching them in a related but isolated fashion.
- Librarians need to continue to seek collaborative projects and develop the connections necessary to work closely with faculty and to dedicate the time to engage in true collaboration.

- Librarians must continue to better educate themselves and teaching faculty on IL concepts, standards, learning outcomes and objectives.

Mature integration methods. The concept of IL instruction, as opposed to training in library use or research methods, is still foreign to most faculty and to many librarians as well. Librarians lay the foundation for the integration of IL instruction by educating themselves and their faculty colleagues about IL student learning outcomes. True integration of IL into courses will also require a paradigm shift on the part of faculty and perhaps even more on the part of librarians. The difficulty of “thinking outside the box” was evident in the design of this course. The “Information Literacy” block was still presented as a separate unit at the beginning of the course, even though librarians were teaching both content and IL and had control over much of the course structure. Although the IL concepts presented in that unit were referred to and built upon throughout the course, the students still saw it as the “library” part of the course, instead of an integral part of their newly acquired knowledge. Dewald et al. (2000) state several times the necessity of faculty and librarians closely working together to integrate IL within the course framework so that students fully understand the librarians’ objectives. This must be the case if IL instruction is to be effective.

In planning to offer the multimedia literacy course a second time, the librarians intend to introduce and teach IL concepts in tandem with the Web site project. For example, IL evaluation criteria will be introduced at the same time as Web design issues; students will then address both criteria and issues in their “good site/bad site” reviews. Legal and ethical issues such as copyright and plagiarism will be integrated into the section concerning development of project content. These issues will be related to the media law and ethical issues to which students are exposed in other graduate courses. Students will be required to include information from (or at least a bibliography of) Web- and print-based materials in order to integrate the development of information access skills into their assignment.

Another course activity subject to revision is the use of student groups to construct Web sites. The benefits of working in groups include many advantages important in this course, namely:

- Assistance of less technologically sophisticated students by those more advanced;
- Generating more student discussion and new ideas; and
- Reducing individual frustration with unfamiliar concepts (Oberman, 1991).

Although some benefits resulted, it was apparent from the student surveys that group activity actually increased the level of frustration. The frustration was due to unresponsive group members and the problems associated with students hindered by very different schedules. Moreover, it is

possible that, for a project this large, the distance-learning environment does not support the level of teacher supervision needed to guide group work. Oberman (1991) points out that "active learning requires the teacher, or leader, to assume the roles of manager, expert, consultant, and interpreter, [and to provide] appropriate reinforcement and feedback to students at critical junctures in the active learning sequence" (p.199). In the future, the Web site will be an individual project coupled with a shorter group assignment that provides some peer-to-peer interaction.

Web portfolios created in the course met with varied levels of success. The potential of portfolio assignments for developing and assessing IL skills is described in detail by Dewald, et al. (2000). Because instructors were unfamiliar with the concept of Web portfolios when the class started, they did not start the project early enough in the semester, or devote enough time to it at the end, to take advantage of these possibilities. However, future sections of the course may include an ongoing portfolio assignment, which will help the students integrate IL concepts into their knowledge base by encouraging them to draw connections between their communications education and the new multimedia/IL concepts they are learning. Such an assignment will also allow for continuous assessment and feedback regarding information access skills as well as comprehension of higher-level IL issues like copyright.

Connections and collaboration. Successful integration of IL into courses requires ongoing collaboration between librarians and faculty. Developing initial connections with faculty is the necessary foundation upon which to build collaborations. For librarians, being active in campus activities and committees, building individual relationships as part of academic departmental liaison duties, and heavy involvement in freshman experience or other core courses are all ways to connect with faculty. Librarians must take advantage of every available opportunity to educate faculty about the many contributions that librarians can make to student learning, especially educating students about information and the issues surrounding its proper use.

The collaboration among the communications professor, the user education librarian and the library Webmaster worked extremely well. Team-teaching the Heritage courses had built trust in each other's expertise and experience, which paved the way for smooth coordination of duties. The librarians relied upon the communications professor for subject expertise (e.g., what information the students should already know from other classes in the degree program) and guidance in handling the classroom management duties with which librarians were unfamiliar. Coordination among the three was accomplished by phone, through e-mail or brief chats on campus and the occasional lunch meeting in the cafeteria.

Time to collaborate. The only major obstacle to offering the course again is lack of time. The librarians involved in this course can attest to Winner's (1998) statement that "teaching users to understand the structure and role

of information and to use critical thinking in the evaluation and selection of material they receive is labor-intensive" (p. 26). Libraries can handle this issue of time in one of two ways: by reassigning librarian time to team-teaching, or by paying librarians on an overload basis for teaching, as Winner suggests (1998). The time involved is significant enough that the responsibility should never just be added to regular duties, any more than classroom faculty should teach an overload class without some compensation, in either time or money.

Educating faculty and themselves. Collaborating to teach IL provides many benefits to librarians as well as to faculty and students. In addition to increased knowledge of IL and how to integrate it into courses, librarians improve their relationships with teaching faculty and students. The ongoing interaction between students and librarians in this course allowed a true relationship to develop. Students in the class took advantage of other opportunities to interact with the librarians, such as visiting the library reference desk to meet the course instructors and using APSU's live online reference service.

The whole experience of teaching a course also improves the effectiveness of librarians' curriculum development. Instructional design and active learning activities studied for the purpose of this course carry over into the development of other forms of instruction. Related to this are the additional insights into student behavior beyond that seen in one-time or short-term instruction, which can then be applied into those types of instruction. Finally, the very fact that librarians have taught a "regular" class and have real-world experiences with integrating IL, increases librarians' credibility with other faculty. This credibility is vital in all librarian/faculty interaction, but is doubly so when, in promoting the integration of IL, librarians step into the teaching arena. Both librarians and teaching faculty will grow in their knowledge of IL because of shared academic experiences. They will continue to collaborate on the integration of IL into the curriculum; and they will develop workable, mature methods for integrating IL concepts into traditional coursework and assignments.

CONCLUSION

The role of the librarian is changing in the virtual environment. The ability to adapt to changing roles lies in librarians' willingness to experiment with new ways to accomplish their libraries' missions. Librarians whose organizations must serve distance learners are faced with the challenge of integrating IL student learning outcomes into online courses. Becoming more knowledgeable about instructional design in the online environment is necessary. Boldly experimenting with new modes of instructional delivery can invigorate librarians and the services they offer.

Beyond instructional design, the successful integration of IL outcomes in online courses depends upon the connections librarians form with their

faculty colleagues. Connections evolve into collaborations in which librarians must take the lead to further educate themselves and faculty about the IL learning outcomes. Only when librarians and faculty work in tandem to achieve the common goal (information-literate students) can IL instruction seamlessly merge with, not merely flow beside, course content.

Many lessons were learned as a result of implementing this graduate multimedia course. Changes in content, assignments, and delivery modes, which will be implemented the next time this course is offered, are being considered. Many of these changes appear in this article. Overall, however, the three instructors believe the course was successful based on their observations of the student learning which took place, as well as on feedback from the students. Much was learned about collaboration, instructional design in the online environment, and the ACRL *Information Literacy Competency Standards for Higher Education*.

This knowledge and experience will be put to good use, both in more traditional settings as well as in the online environment. It is hoped that what was shared here will serve as a model for future collaborative partnerships between faculty and librarians. Working together in such partnerships will ensure that students who learn from a distance truly master information literacy competencies.

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