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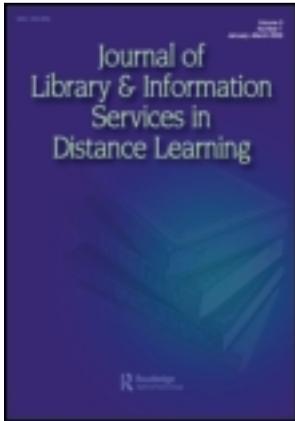Martha Fallahay Loesch, *Seton Hall University*

From Both Sides, Now: Librarians Team Up with Computer Scientist to Deliver Virtual Computer-Information Literacy Instruction

Martha Fallahay Loesch [a]

[a] University Library, Seton Hall University, South Orange, New Jersey, USA

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From Both Sides, Now: Librarians Team Up with Computer Scientist to Deliver Virtual Computer-Information Literacy Instruction

MARTHA FALLAHAY LOESCH

University Library, Seton Hall University, South Orange, New Jersey, USA

Two members of the library faculty at Seton Hall University teamed up with a respected professor of mathematics and computer science, in order to create an online course that introduces information literacy both from the perspectives of the computer scientist and from the instruction librarian. This collaboration is unique in that it addresses the issues of information literacy both from the internal and external design and workings of computer processes; how logic is programmed into the computer and how information is retrieved. Students ultimately become both designers and users—the quintessential computer-literate life-long learner.

KEYWORDS Information literacy, distance education, collaboration, virtual course, instruction librarian, computer scientist, Quality Matters, faculty

INTRODUCTION

There has been a concerted effort during the past decade or so to infuse information literacy in college and university courses throughout the United States. At Seton Hall University, a mid-sized, private Catholic university located in South Orange, New Jersey, library faculty have been instrumental in successfully establishing information literacy as one of five essential core competencies at both the core curricular and advanced departmental course levels. Obtaining the understanding and commitment of the teaching faculty to include information literacy as a core competency on campus involved much time and patience; however, this endeavor resulted in the teaching

Address correspondence to Martha Fallahay Loesch, Seton Hall University, University Library, 400 South Orange Avenue, South Orange, NJ 07079, USA. E-mail: martha.loesch@shu.edu

faculty's heightened respect and esteem for their library faculty colleagues. As a consequence of this, a respected computer science professor has collaborated with two members of the Seton Hall University Library faculty, one an Associate Professor, the other an Assistant Professor, to create and teach a virtual information literacy course.

The library literature abounds with examples of librarian-faculty collaboration in the delivery of information literacy instruction. However, this particular collaboration is unique in that it addresses information literacy both from the internal and external design and workings of computer processes; in other words, how logic is programmed into the computer and how information is retrieved. Students learn the essence of programming from the computer scientist, and through the experience and acquisition of learned retrieval skills reinforced by the library faculty; they gain an understanding of information literacy from the perspective of the user as well. Students ultimately become both designers and users—the quintessential computer-literate life-long learner.

LITERATURE REVIEW

In the 1990s there was a major shift among academic institutions to create distance education programs that coincided with the expansion of the World Wide Web and Internet access. Academic librarians availed themselves of this opportunity to play a key role in these programs. One early player in this endeavor was The State University of New York at Plattsbugh, which, in 1994, obtained a one million dollar grant from the U.S. Department of Health and Human Services. The grant proposal exemplified a successful partnership between the dean of Professional Studies and the dean of Library and Information Services who "both envisioned a working partnership between their divisions that would ensure equity of academic richness and academic rigor for distance education students."[1] In order to assure that students might take full advantage of the many library resources Feinberg Library had to offer, the librarians worked with the teaching faculty to prepare printed guides that corresponded with class syllabi, a short video tour of the library, and appointed an Outreach Librarian, who was responsible for maintaining contact with and assisting students with their research throughout the course.

In 2001 the Association of College and Research Libraries (ACRL) established their *Guidelines for Distance Learning Library Services* to assist academic librarians in their collaboration with faculty and to ensure online students the full benefits of a virtual education. The Outreach Librarian of the late 20th century evolved into the Embedded Librarian of the 21st century where the librarian's presence in virtual courses became established and ACRL updated their guidelines to the *Standards for Distance Learning Library Services* in 2008.[2] Librarians have had to struggle to gain a foothold in

the virtual learning environment; however, numerous collaborative relationships have existed between librarians and faculty. The following paragraphs exemplify some of the more innovative models of collaboration shared by the two groups.

Tom Reidel, Distance Learning Librarian at Regis University in Denver Colorado, noted a dramatic increase in distance education courses offered in the early 2000s, as well as the lack of appropriate library resources included in faculty course syllabi. He was concerned "that a whole new generation of distance education students had the potential of falling through the cracks of library service."[3] Thus, he successfully set about initiating, campaigning and incorporating library instruction in both undergraduate and graduate online courses by means of embedding course-specific resource links in library-related Web pages.

Seeking a more active role in online education, reference librarians at the University of Missouri St. Louis Libraries were added to the course management system (CMS) of a distance education course. In this capacity, the librarians mostly posted articles and databases relevant to specific course syllabi. This seemingly limited role of the librarian was refuted by the university faculty and students who recognized "the value of their service as individuals . . . the librarian was viewed as a courteous, approachable, and knowledgeable gateway to the library."[4]

The embedded librarian eventually became an established presence within distance education, but their next goal was to remove themselves from the sidelines and assert a more active role in course development. In 2007, Dede Nelson and Kim Duckett of North Carolina State University, one an instructional designer, the other the Principal Librarian for Digital Technologies and Learning, collaborated on a virtual course with an assistant professor in the Department of Adult and Higher Education. As a result of this very successful partnership, Nelson and Duckett created and published their foundation for a collaborative course development model. The model embraces all three professionals: the Instructor who provides "teaching and content expertise," the Librarian who "offers expertise in information literacy, research strategies, copyright, intellectual property," and the Instruction Designer who "ensures targeted learning objectives linked to specific learning activities, and measurable outcomes."[5] Consequently, the distance education student reaps the full benefits of a well-designed, high-quality, student-focused, virtual course.

The Saskatchewan Institute of Applied Science and Technology (SIAST) elevated the collaborative professional team approach with their inclusion of two librarians among a developmental team of 13 members involved in the design and delivery of interactive, virtual course content. The team approach was so successful that the Canadian Association of Distance Education recognized SIAST with their annual award for two consecutive years, 2004 and 2005. The librarians effectively made distance learners aware of the wealth of

library resources available to them; more specifically they "identified sources, made suggestions for research materials, and engaged in high-level searching." They also served "as research consultants, reference points, collection development selectors, and as instructors."[6]

THE SETON HALL UNIVERSITY EXPERIENCE

In summer 2008, a catalog librarian, an instruction/reference librarian and a computer science and mathematics professor at Seton Hall University received an Arts and Science (A&S) online course development grant through the university's Teaching Learning and Technology Center (TLTC). They envisioned creating an online course that introduced information literacy to the students, both from the perspective of the computer scientist and from the instruction librarian. The three credit course was appropriately named "Computers, Information and the Modern World" and was offered through the Department of Mathematics and Computer Science in the College of Arts and Sciences. Whereas most faculty recipients of the A&S grant converted existing traditional classroom courses to an online delivery format, this group was distinctive in designing a completely original distance-education course.

The TLTC assigned an instructional designer to the project in order to facilitate the course development and ensure that the course design adhere to the "Quality Matters (QM) Rubric for Online and Hybrid Courses" format. The QM Rubric was established to ensure "improved student learning outcomes and retention [and the] adoption of a systematic and comprehensive continuous quality assurance process that includes faculty training, course development, and course revisions that are aligned with accreditation standards."[7] The program is composed of eight essential elements:

1. Course overview and introduction
2. Learning objectives
3. Assessment and measurement
4. Resources and materials
5. Learner engagement
6. Course technology
7. Learner support
8. Accessibility[8]

The design, construction and content of the online course had to incorporate all eight elements, which were subject to review by a certified QM representative before release. If all eight standards were not sufficiently incorporated, the course would be sent back to the originators for revision.

The focus of the QM standards was to guarantee a well constructed, self-guided, informed course for the enrolled student. Designing an on-line

course is difficult in that the developers must anticipate students' questions and possible confusion. The virtual instructor must enable students to answer their own questions. Thus, in the absence of a real professor, each element must be clearly addressed and explained. With this in mind, the TLTC created a fifteen section course template in Blackboard, the university course management system, which introduced course materials in a logical sequence of increasing difficulty:

Announcements,
Begin Here,
Faculty Information,
Course Information,
Contacts,
Course Documents,
Course Materials,
Assignments,
Communication,
Discussion Board,
Course Readings,
External Links,
Tools,
Technology,
Faculty Tool Box.

The TLTC populated the more general usage segments: *Begin Here*, *Communication*, *Tools*, and *Technology*, while the professors were responsible for the remainder.

The *Begin Here* section (see Figure 1) provides a general overview of the course organization in Blackboard. It identifies the navigational symbols, informs the user as to where to locate course-related information (syllabus, reading materials, assignments, technology contacts); states how to contact the instructors, how to post to the discussion board, submit an assignment, access a library database, find grades, and it also explains what is provided in other tabs. The *Technology* tab lists the specific computer requirements necessary for the course, including hardware specifications, type of Web browser, software applications, free downloads, and tips regarding the pop-up blocker, antivirus and spyware protection, and firewall settings. Disability Support Services offers accommodations for students with disabilities and special needs. This section also offers links to student resources, Blackboard tutorials, and additional software choices (see Figure 2).

The *Communication* and *Tools* tabs are similar in that both display links to resources that may enhance the user's virtual course experience: email, a tasks organizer, course portfolios, journals, blogs, wikis, the My Grades site and other such enhancements.
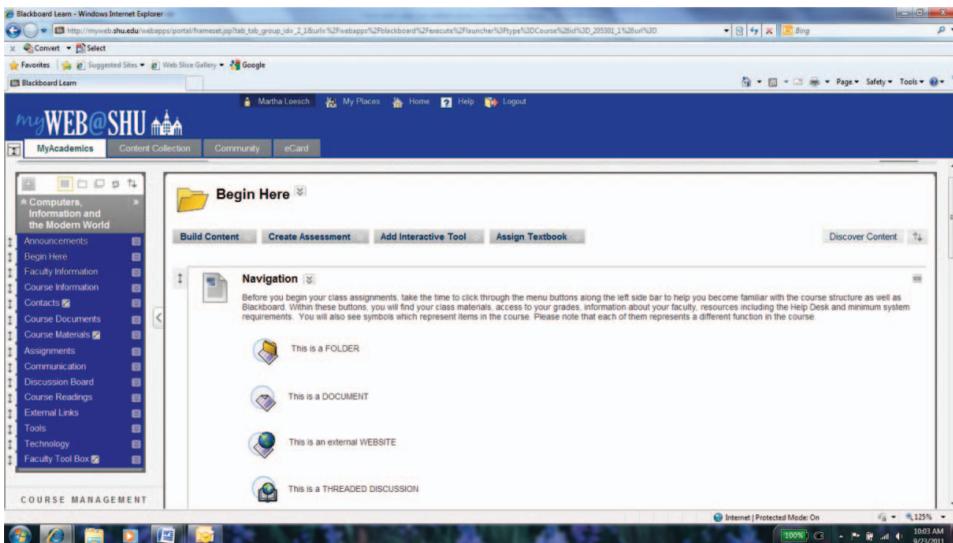
FIGURE 1 Blackboard 'Begin Here' course tab. (Color figure available online).

Technology

Build Content ⌄ **Create Assessment** ⌄ **Add Interactive Tool** ⌄ **Assign Textbook** ⌄

Students with disabilities and special needs ⌄

A Note for Students with Disabilities
If you have a documented disability, or think you might have one, you may be eligible for accommodations in academic classes, the residence halls, food service areas, etc., under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. Disabilities may include those that are permanent or temporary and include, but are not limited to: learning disabilities, ADHD, medical issues, psychological or psychiatric problems, limited mobility, low vision or blindness, and hearing impairments. more

Hardware and Operating System Requirements ⌄

These are the minimum hardware requirements and operating systems you will need to successfully use Blackboard. If you have any questions, you may call or email Seton Hall Universities Helpdesk at 972-275-2222 or helpdesk@shu.edu

Operating System:
- Windows XP or Windows Vista
- MAC OS 10.3

Processor speed:
- 400 MHz Intel Pentium II processor or equivalent
- 800 MHz PowerPC G4 processor or better

Memory:
- 1 GB of memory

Hard drive:
- 1 GB hard drive capacity

Internet Connection:
- 56Kbps or faster modem (Cable modem or DSL is highly recommended)

Monitor:
- A monitor capable of at least 800 x 600 resolution

Sound Card:
- 16 bit sound card
- Speakers (computer speakers work just fine)

Web Browsers and Additional Software ⌄

Web Browser:
- PC - Microsoft Internet Explorer 6.0 or higher, Mozilla Firefox 2.0x
- MAC - Mozilla Firefox 2.0x, Safari 2.0

FIGURE 2 Replica of Blackboard 'Technology' tab. *(Continued)* (Color figure available online).

- AOL – Using the AOL browser to access Blackboard may cause problems. Establish your internet connection with your AOL service but use Internet Explorer to connect to Blackboard

Software:
- Microsoft Office 2003 recommended

FREE downloads:
- Adobe Reader - (http://www.adobe.com/products/acrobat/readstep2.html)

- Real Player - (http://www.real.com)
  Windows Media Player - (http://www.microsoft.com/windows/windowsmedia/player/download)

- Quick Time - (http://www.apple.com/quicktime/download/win.html)

- Flash Player -
  (http://www.macromedia.com/shockwave/download/download.cgi?P1_Prod_Version=ShockwaveFlash)

Tips:
- Set your pop-up blocker to "Trust" the Blackboard site to allow necessary pop-ups for your courses.

- Keep antivirus and spyware protection programs current by frequently checking for updates and schedule regular scans of your computer for early detection.

- Check firewall settings (if applicable) to make sure settings aren't blocking Blackboard

Student Resources ⌄

Blackboard Tutorials ⌄

Additional Software ⌄

FIGURE 2 (Continued) (Color figure available online).

The "Computers, Information and the Modern World" course developers geared the course content for freshmen and sophomores. At the initial project development meeting, they established an outline of the project deliverables and a timeline. Each of the three professors was assigned and held responsible for specific themes, objectives, and goals, but all contributed equally to the discussion topics, assignments, projects, course materials and bibliography.

The stated course description including aim, objectives, and goals are:

The Aim of This Course

An on-line course encourages self-motivated students to realize their own goals and objectives, and provides a measure of accomplishment and progress throughout the course. This course uses a combination of interactive tutorials, discussion board threads involving both student and

faculty feedback, assignments partially focused on topics of the student's choice, and projects in database design and webliography development.

The unifying themes of the course will be (1) acquisition and evaluation of information, (2) use of critical thinking and logic for problem solving, (3) common structure and concerns across a variety of computer applications, (4) the structure of hardware and software, and its effect on computer problem solving, and (5) the impact—positive and negative—of the computer and electronic information on the modern world.

Objectives

1. Students will understand the modern computing and information environment, at the level of an interested non-specialist.
2. Students will understand social, ethical, legal, economic, and public policy issues related to computing, information technology, and information fluency.
3. Students will be able effectively to acquire, evaluate, and use information from electronic resources.
4. Students will understand the context, including dangers and preventive strategies, of computer security.

Goals

1. The student will demonstrate understanding of Boolean logic, as used in programming, relational databases, and search engines.
2. The student will demonstrate some grasp of the logical and technical mindset and skills necessary for dealing with programming.
3. The student will (with assistance) design, write, compile and run simple short programs and/or relational database queries.
4. The student will provide a non-technical view of the modern computing and information environment, and use a variety of its services.
5. The student will outline the basic structure, operation, and information flow of program execution, in addition to the Internet and World-Wide Web.
6. The student will list and document a set of social, ethical, legal, economic, and public policy concerns related to computing, information technology, and information fluency, and provide a preliminary evaluation of the implications of one or more of these concerns.
7. The student will use electronic resources intelligently, locating, acquiring, evaluating and using information efficiently and effectively.
8. The student will formulate and refine a research strategy and explain the steps, interactions, and results.

9. The student will use a number of search engines, databases, and other electronic resources.
10. The student will prepare an annotated bibliography/webliography on a topic of his or her choosing, approved by the instructor.
11. The student will present a sophisticated view of the major threats, protections, and security on the computing environment and on society as a whole.

The course developers constructed 13 units, each of which corresponded to one week of the semester:

Unit 1: Computer structure and organization; hardware, software and the Net.
Unit 2: Logic, computers, and problem solving.
Unit 3: Logic for searching and search queries.
Unit 4: More on query operators and Boolean queries; evaluating Web site content and style.
Unit 5: Selecting and combining information sources; using electronic resources intelligently; creating a Webliography.
Unit 6: The structure of the Web; interaction with network structure; Web caches; Wikis and Wikipedia; HTML and related technologies.
Unit 7: The impact of the computer: social, ethical, legal, economic and public policy issues; Intellectual property, privacy, and computer security.
Unit 8: The changing Internet; the search engine universe; matching the search engine to the task and to your learning style; the hidden Web.
Unit 9: Spreadsheets: advanced features, using formulas and macros for problem solving.
Unit 10: Relational databases; queries in relation databases; writing queries; using relational databases for problem solving.
Unit 11: The impact of the computer and electronic information on education, society and politics.
Unit 12: Another look at programs; writing simple programs (CS); another view of software; how can we get software to do what we want it to?
Unit 13: More on security; encryption; security policies.

The developers initially created each unit in PowerPoint, with the intention of providing an audio component at a later time using authorPOINT Lite, free software that allows final files to be delivered in Flash format. Since the developers taught and performed other professional functions while working on the course content, the actual course production process lasted nearly five months, from December 2008 through April 2009. In order to allow for colleague feedback, and to ensure that the project was on target with its deliverables, the course developers met periodically with their instructional designer. The meetings were always amiable; all four participants respected each other and the project so that differences of opinion on direction, con-

tent, or assignments were few and far between. An illustration of the degree of collegiality among the four team members occurred during one meeting when all four members were on the floor at the same time plugging their laptops into the floor outlets which were situated under the conference room table. Someone remarked that it reminded them of kindergarten when children play on the floor together. Everyone was able to share in a good laugh.

During the entire collaboration, the course developers busily formulated their content culled from their collective years of teaching, research, and working with the material. They used email extensively to transmit ideas, share projects, offer suggestions, and collaborate on content. They also shared their offices when working together on a component of a unit, grabbing time here and there in their busy schedules. As they completed the different units, the collaborators emailed them to the instructional designer for submission into the course shell in Blackboard.

As the April 15, 2009 deadline loomed, the course was taking shape, but there were delays, as well. The participants revisited the Quality Matters Rubric in order to ensure the eight standards were integrated throughout the course components. For example, at one point it was observed that International Standard Book Numbers (ISBN) had to be included for every title in the extensive bibliography, as well as all course textbooks listed in the syllabus, so a mad scramble to search for them ensued. Likewise, all hypertext links periodically had to be retested in Blackboard to verify their viability. When the course developers compiled bibliographies from three different Word documents and added them to the Blackboard course shell, the layout changed drastically thereby creating a major formatting problem.

After several revisions, the course passed the Quality Matters review with its second submission. The instructors were elated and recognized that a strong bond of friendship and collegiality had formed as a result of so close a collaborative effort.

CONCLUSION

As the field of academic librarianship continues to transform to keep pace with the evolutions in technology, education and information, librarians remain at the forefront of progress. Librarians are no strangers to change and indeed are known for their adaptability and innovative qualities. As technology has impacted higher education with the widespread expansion of distance education, librarians have sought to carve a vital and permanent role making information literacy instruction an essential element, with the objective of enriching and improving the distance-education student's experience. As Owens and Bozeman so succinctly state in their article, *Toward a Faculty-Librarian Collaboration: Enhancement of Online Teaching*

and Learning, "Without initiative and action from librarians, the information needs of online students will not be met."[9]

Many academic librarians throughout the world have successfully made a great impact in virtual education. The "Computer, Information and the Modern World" online course, created as a collaboration between a computer scientist and two faculty librarians at Seton Hall University, is just one example, but it is unique in that it provides students with an enhanced understanding of both computer technology and information literacy; a comprehensive depiction of the information environment. It was a truly collaborative effort in which all three professors understood and respected each other's expertise and pedagogy. The faculty members bonded well, produced an outstanding virtual course, gained much mutual respect, and an enhanced understanding and appreciation of the distance-education terrain.

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