

Building Library 2.0 into Information Literacy: A Case Study

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Abstract

This chapter describes a pilot program at Wake Forest University's Z. Smith Reynolds Library that was designed to revitalize our information literacy instruction through the introduction of Library 2.0 concepts. The pilot explored new methods and technologies that can be used to engage students in a collaborative environment. The goal was to produce a class that is more relevant to how students learn through using current information issues, collaborative social software, and information management applications. Included is a discussion of conventional information literacy program standards and educational theories that informed the framework of the pilot's structure.

Introduction

After three years of teaching a one-credit information literacy elective at Wake Forest University's Z. Smith Reynolds Library, the authors saw a need to revitalize our class to make it more compatible with student approaches to research. We saw that students were coming to the class with a set of core information seeking practices that they have adopted through their use of the Internet for personal and previous academic work, and that trying to teach them to abandon those practices in favor of the traditional idea of the "right" way to conduct research was unsuccessful. By approaching information literacy from their existing skill set, we hoped to demystify information management and research methods, assist students in bridging technology skills, and inform them of current information issues.

Students have become more proficient at conducting research over the last several years as technological advances have become increasingly available to them. The landscape of available information now includes both library resources and a wide variety of freely available electronic resources. When taking this "new world" into consideration, we began to re-think the way we were teaching the course "Accessing Information in the 21st Century." In doing this, we questioned the foundations of our information literacy curriculum with respect to current methods over traditional methods, and the relevance of our own approaches to information discovery, access, and evaluation.

The course modules emphasized the various information tools that students use socially as the foundation for discussing information literacy concepts, and encouraged students to use these tools in other information seeking contexts. In re-formatting course content, we endeavored to utilize Library 2.0 concepts in the framework of accepted information literacy standards and educational theory.

Information Literacy Standards

It is generally accepted that an information literate citizenry is an essential goal in today's global world. A customary description of information literacy is "the set of skills needed to find, retrieve, analyze and use information" (Association of College & Research Libraries 2007). But, with the proliferation of information sources and availability today, this definition seems a bit one-dimensional. A more

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comprehensive definition of information literacy is “the ability to locate, manage, critically evaluate, and use information for problem solving, research, decision making, and continued professional development” (Orr, Appleton, and Wallin 2001).

Information literacy instruction has been designed to equip people with the critical skills necessary to become independent lifelong learners. Although many K-12 schools are incorporating this type of instruction into their curriculum, higher education is still the primary location for this education to occur.

There are various information literacy models in existence today that institutions can use to develop their programs. Prominent ones include the Big6, Shapiro and Hughes’ Information Literacy as a Liberal Art and, ACRL’s Information Literacy Competency Standards for Higher Education.

Big6 (<http://big6.com/>) is a model developed by educators Mike Eisenberg and Bob Berkowitz that is process-based. Students are taught to approach problem-solving via six stages: task definition, information seeking strategies, location and access, use of information, synthesis, and evaluation. This can be accomplished consciously or not and does not have to be done in a linear fashion. Its goal is to teach students to focus on the entire research process and not just resources and location skills. Originated in the late 1980’s to meet needs in the K-12 arena, the model has been adopted in higher education settings as well (Hagan Memorial Library 2007). Students who learned the Big6 in K-12 have carried the skills with them into their college years and utilize them in their academic careers. The standards listed by ACRL and those in the Big6 complement and strengthen each other (Story-Huffman 2002).

Information Literacy as Liberal Art approaches information literacy by defining different categories of literacy skills as opposed to defining specific actions or processes. Jeremy Shapiro and Shelley Hughes maintain that information literacy is a new liberal art which includes technical

and critical skills required to access information. They argue that “critical reflection on the nature of information itself, its technical infrastructure and its social, cultural, and even philosophical context and impact” (Shapiro and Hughes 1996) are components of the literacy process. They frame a curriculum that consists of sets of literacies, consisting of:

- Tool literacy—ability to understand and use the practical and conceptual tools of current information technology
- Resource literacy—ability to understand the form, format, location and access methods of information resources
- Social-structural literacy—understanding the social nature and production of information
- Research literacy—ability to understand and use the IT-based tools relevant to the work of today’s researcher and scholar
- Publishing literacy—ability to format and publish research and ideas electronically
- Emerging technology literacy—ability to adapt to, understand, evaluate and make use of the continually emerging innovations in IT

ACRL’s Information Literacy Competency Standards for Higher Education: Five core information literacy competency standards were developed by ACRL (Association of College & Research Libraries) in 2000 (2000). These have become the standard that has provided the foundation for most information literacy curriculum in higher education. Their purpose is to establish a framework that can be used to assess students’ ability to effectively manage information seeking skills.

The five standards are:

1. The information literate student determines the nature and extent of the information needed. (know)
2. The information literate student accesses needed information effectively and efficiently. (access)
3. The information literate student evaluates information and its sources critically and incorpo-

rates selected information into his or her knowledge base and value system. (evaluate)

4. The information literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose. (use)

5. 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. (ethics)

A review of many information literacy (IL) syllabi and course Web sites points to the use of the ACRL standards as the prominent structure around which courses are built. The bulk of curriculum time in most syllabi is spent on the first performance indicators in Standard #2—Accessing Needed Information. Performance indicators for this standard include such skills as “selects the most appropriate...information retrieval systems for accessing the needed information”, “constructs and implements effectively-designed search strategies”, “retrieves information...using a variety of methods” (use of search systems and classification schemes), “refines the search strategy,” and “extracts, records, and manages the information and its sources” (includes the need for citation skills) (Association of College & Research Libraries 2006).

Typical modules of instruction that meet ACRL competency standards are often “how-to” or “activity-based” in nature:

- Choosing a Topic
- Identifying Types of Information Sources
- How to Find a Book (Use the Online Catalog)
- How to Search a Database to Find Articles
- Keyword vs. Controlled Vocabulary Searching
- Classification Systems
- Complex Search Construction (Boolean Searching)
- Source Citation
- Internet Search Engines
- How to Evaluate Information Sources
- What is Plagiarism?

Overview of Information Literacy Approaches

In the higher education arena, one can find a variety of approaches to delivering information literacy instruction (ILI). Traditionally, “one shot” classes were the staple. These are also known as BI (bibliographic instruction) sessions and preferably are course related and integrated. With the explosion of online distance education, Web-based tutorials are also popular for their 24/7 access and consistent presentation.

Librarians have long recognized that “one shot” classes fall far short in teaching literacy skills. Many institutions have developed formal free-standing information literacy courses that range from non-credit to credit-bearing, from required to elective, from core curriculum to discipline specific. Because these typically cover multiple sessions, more opportunity is afforded for in-depth exploration and learning. Some schools have taken the next step and have integrated information literacy instruction into the overall curriculum (Kasowitz-Scheer and Pasqualoni 2002).

No matter which approach is selected, ILI planners strive to incorporate as many of the “best practices” to meet their missions. These include such components as relevance to course goals and curriculum, formation of partnerships between faculty and the library, scalability, and the use of student-centered, active, and collaborative learning (Kasowitz-Scheer and Pasqualoni 2002).

Overview of the Z. Smith Reynolds Library Information Literacy Program

Wake Forest University, a private institution located in Winston-Salem, NC, is a liberal arts institution with undergraduate, graduate, and professional programs. Undergraduate enrollment is 4,300 with a graduate and professional school population of 2,400. Z. Smith Reynolds (ZSR) Library is the largest library on the two campuses,

with a mission "to support the current and future instructional and research needs of the faculty and students of the College, the Calloway School, the Graduate School of Arts and Sciences, and the Divinity School of Wake Forest University, as well as the information needs of the administration and staff of the University." (Z. Smith Reynolds Library 2007)

In the spring of 2003, ZSR Library piloted a one-credit information literacy elective, "Accessing Information in the 21st Century." It was well-received and was permanently incorporated into the university curriculum that fall, filling nine sections. Topics covered in the fourteen-class course included how to: select a research topic, prepare a search strategy, select the best information, use search engines and print material, determine scholarly information, and decide if one is looking at misinformation. It also covered copyright, plagiarism, and freedom of information. A curriculum template was developed within our University Blackboard course management system by the Information Literacy Librarian. The template was designed to standardize and streamline the instruction process, and included a suggested syllabus, content modules, class exercises, and assignments. In the beginning, instructors followed this set "script" so that each section covered identical subject matter.

The course has continued to fill up to eleven sections each semester since 2003. Course work involved a series of research exercises centered around student-selected topics, ultimately resulting in an annotated bibliography comprised of a series of resource types including reference resources, books, journal articles, and free Internet resources. Students were allowed to self-select topics that they have been assigned to research in another class, or ones that had caught their interest. During the course, individual assignments became building blocks toward the final producible: an annotated bibliography that required a specified number of resource types (reference, books,

journal articles, free Internet sites) and then addressed why each resource selected was the most appropriate and valuable.

Instructors came from the Information Services team and interested librarians from different departments in the library. As the various instructors gained experience in leading the classes, it was inevitable that different teaching approaches have been incorporated. Some of the approaches highlight different types of library resources, methods of evaluation, and levels of electronic vs. print emphasis. Despite these differences, a majority of instructors continue to focus on traditional research skills and on the production of the annotated bibliography as the final project.

Because the authors are technology-oriented due to our "regular" assigned responsibilities on the Library Information Technology team, it was natural that our section was one of the early adopters of a more technical slant to the subjects being taught. We included print resources, of course, but we focused more on electronic solutions to information retrieval and management. As soon as the university got a site license for the reference management software EndNote, competence in the use of this software became a core skill in our section. After this was incorporated, we found, through our course evaluations, that EndNote was a highly rated part of our section's curriculum. Students' evaluations on components of the course that we shared with the other sections were consistent: to them, the least useful modules were classification systems, using print monographs, citation syntax, and Library of Congress Subject Headings.

The realization that students were tuning out on traditional information literacy topics and were engaged with the prospect of mastering a research management tool started our conversations. How could we modify our class to become more relevant to our students' perceived needs, while ensuring they acquire the skills they need? It was evident to us that there was a major gap that could be bridged with the right approach.

The Initiative

ILI and Library 2.0

During the summer of 2006, a group of our ILI librarians met weekly to dissect our program's curriculum and to explore how it could be updated. There was a consensus that we had to find new "hooks" that would engage the students in a more participatory fashion and teach them skills that not only would be valuable in their academic careers but that also would travel with them beyond their school years. It quickly became apparent that we were talking about the need to weave in many Library 2.0 concepts: introducing social scholarship and radical trust in an environment where we offer a higher level of student control of course direction. In the spring of 2007, the authors developed and delivered a course which focused on these ideas.

In this approach to information literacy, course content focuses on helping students to recognize the skills they already have rather than emphasizing skills which have only limited relevance in their information environment (such as complex catalog searching). This approach included

- ♦ drawing parallels between commonly known applications and information issues (privacy, access, management)
- ♦ introducing a number of tools and approaches for discovering, acquiring, managing, and evaluating information
- ♦ student driven discussion of information issues

We emphasized approaches over specific applications and methods, and encouraged students to try a number of avenues for information discovery and management. As a result, several modules typically found in other information literacy courses, including complex Boolean logic and resource centric classes (such as "Books" or "Reference Resources"), were replaced with more general topics which focused on the research process, information management, and organization techniques. This meant that we emphasized research management tools (in our case EndNote) over memoriz-

ing proper citation styles. In following with current education approaches including active learning, problem-based learning, and information technology literacy, this course used technology and instructional approaches which emphasized group learning and student engagement with information literacy issues.

Students were not given prescribed assignment formats to complete, but rather were expected to create content based on their concept of what the assignment entailed. Course assignments focused on both individual and group-work, and a conscious effort was made to have students provide the content and direction for at least two of the twelve classes. Instead of covering social information issues as part of course content, students were assigned one of these issues as their research area for the semester. Students were then given time to present their findings during class and relate their experiences with the rest of the class.

Instructional Methods

When planning the re-design of the information literacy curricula, the authors wanted to base course pedagogy on student-driven instructional models. In addition, while course content was largely based on what the instructors considered to be most relevant to current information literacy, it was also important to structure content in an optimal way to pique student interest.

This discussion of course methods includes an overview of the constructivist approach to learning, techniques for applying inquiry/problem based learning in the classroom, and a review of specific methods organized around Shapiro and Hughes' Information Literacy Model.

Constructivist Learning

While constructivist learning techniques have been popular in educational circles for many years, their use in information literacy has lagged behind. Constructivist learning is based on the idea that students learn and create meaning through an

individual/social interaction with information. As a result, a constructivist learning environment enables students to explore the boundaries of a topic as opposed to a strict, focused curriculum. This often includes challenging students to ask their own questions, find their own answers, and use multiple sense-making techniques to learn.

In their book *In Search of Understanding: The Case for Constructivist Classrooms*, Brooks and Brooks lay out the basis for modern constructivist classrooms. They detail five principles of constructivist classrooms (Brooks and Brooks 2001).

1. Teachers seek and value their students' points of view

2. Classroom activities challenge students' suppositions

3. Teachers pose problems of emerging relevance

4. Teachers build lessons around primary concepts and "big" ideas

5. Teachers assess student learning in the context of daily teaching

These principles underscore the idea that students learn through creating individual understanding by grappling with new information and perspectives. They also introduce Library 2.0 concepts by encouraging students to take control of the course, add/modify content, and drive course direction.

These ideas, while simple enough, can prove difficult to adhere to, particularly in the face of an undergraduate population being presented with admittedly dry material. By turning the approach to information literacy on its side and persuading students to think about it in terms of information skills that they already had, the instructors hoped that students would become more engaged with course content. By employing open-ended, loosely-structured assignments which encouraged students to determine the scope, format, and content of their work in the course, it was expected that students would have to make full use of evaluation and critical thinking skills.

Instructional Techniques and Classroom Approaches

Inquiry (or problem) based learning (IBL) uses constructivist foundations to lay out a mechanism for encouraging students to define and solve their own learning problems. IBL techniques focus on providing students with open-ended problems which encourage them to define the boundaries of the work and direct their own information seeking. IBL began in the medical field in the 1970s. Over the last thirty years, it has been adopted in other fields (Savery and Duffy 1995).

IBL is often contrasted with traditional classroom approaches which emphasize lecture, direct factual memorization, and simple quantitative evaluation. Dave Knowlton discusses learning techniques related to IBL as including open inquiry and student centered learning, collaboration, self-directed learning, and active participation. (2003). Katherine Steeves expands this list to include in-depth questioning, integrated knowledge and skill learning, and time for reflection (2005). Brooks and Books point out that teachers should encourage student autonomy, allow students to drive both lessons and course content, encourage dialog and collaboration, and provide students time in class to create group relationships (2001).

Collaborative work is often a key component of IBL approaches. Lutz & Huitt outline four components of cooperative learning approaches (2004):

1. There must be cooperative interaction among groups.

2. Group incentives must be provided.

3. There must be individual accountability.

4. There must be an equal opportunity for all students to earn high scores and contribute to the group effort.

Cooperative learning includes both group participation and student contribution back to the course. This idea, that students direct course content, is key to providing students the authentic environment of inquiry discussed by Brooks

and Books. One important aspect of this is the requirement that the instructors serve as a model collaborative group for the students to follow. By sharing course load, contributing to discussions during class time, and evaluating student work together, the authors attempted to create a visible collaborative environment.

Student Centered, Group Created

The Library 2.0 framework emphasizes user control, radical trust, flexibility, and user autonomy. These ideas are common to the constructivist and IBL teaching philosophies and merge well with the information literacy guidelines discussed above. Further, the goals of lifelong learning, evaluation, and critical thinking are central to the ACRL information literacy guidelines.

In relation to Library 2.0, the Web 2.0 application framework creates software which emphasizes user control, flexible use, and rapid development. The information landscape of the typical college student includes real-time and asynchronous communication, social networking sites, and multi-media applications. While students are specifically familiar with these technologies, the course instructors suspected that they did not automatically generalize these skills into larger information consumption skills. An initial survey of the students in the course revealed that all of the students were familiar with social networking sites in the form of Facebook and MySpace but did not connect those skills to other social networking software including blogs, wikis, and RSS feeds.

Social Software

The goals discussed above required new instructional tools (as opposed to Blackboard, PowerPoint, Word documents, and printed handouts). Social software applications were able to satisfactorily fill many of these roles. They permitted rapid development of course content and served as a collaborative space for students. They served as a bridge between common information literacy skills with

which the students are familiar and the skills that are considered essential in an information literacy environment. Further, social software embraces Library 2.0 concepts such as radical trust and user driven content and creates an environment where students can explore collaborative research models. Much has already been written about the uses of wikis, blogs, and social networking sites in courses, and the approaches used for course management in this case were not much different. In this course, a wiki, hosted on the MediaWiki platform, was used as the primary Course Management System (CMS) and contained course structure/content, student assignments, and contact information. All content created by the instructors and students was open to editing and deletion by all participants. Other social software employed included Flickr (for an information organization class), social tagging sites, and mashup applications that demonstrated information harvesting possibilities and how new knowledge is built from the work of others.

In addition to social software applications, a number of common free and commercial applications were used. Freemind (http://freemind.sourceforge.net/wiki/index.php/Main_Page), an open source mind-mapping application, was used to organize and present class content, MediaWiki extensions were used to embed Freemind, YouTube, and other multi-media content into the course wiki, and openly available applications from Google and other information discovery and distribution sites (employing saved searches, RSS feeds, and TOC services) were used. The specific uses of these applications are discussed in a later section.

The instructors debated the benefits and drawbacks of having students complete assignments in an open wiki. While students are comfortable learning in social environments, it was decided that privacy in evaluation should be guaranteed. For this reason, e-mail and Blackboard were used to provide feedback on assignments. While a wiki was our chosen application, other social software

applications may be more suited to other goals. In selecting the social software application to use a number of questions should be asked:

- ♦ What educational outcome am I trying to achieve?
- ♦ What tools exist (both hosted and local) which could be used easily and securely?
- ♦ What level of privacy and security are required?
- ♦ What timeline do I have for development?

Rapid Course Development

In order to introduce timely information literacy issues, and base content on student needs, the course employed a rapid development framework. This involved constructing a complete template for the course at the beginning of the semester which facilitated the modification of elements based on current events and student feedback. For example, a flare-up issue with Wikipedia in the spring of 2007 met with popular coverage on The Colbert Report. Course content was shifted to include this event. Social software applications allowed a great deal of functionality and flexibility with minimal development, included feeds and current awareness topics (RSS feeds), and facilitated student feedback for current topics.

Applying an Information Literacy Model

The model proposed by Shapiro and Hughes in their 1996 article includes not only traditional literacy instruction but also other literacy components. This approach differs from the ACRL model (Association of College & Research Libraries 2007), which emphasizes general activities around the information use process as opposed to the specific activities suggested by Shapiro and Hughes. Similarly, the model of the Big 6 differs in that it emphasizes processes over the facets of literacy defined by Shapiro.

While each of these models brings many of the same skills together, Shapiro and Hughes' approach is used to discuss the various components

of this information literacy course. Their model underscores the idea that information literacy is not about a process but rather is a multi-faceted approach to consuming information. This model seemed to fit well with the socialized nature of the course structure and provided a framework to include or exclude content.

Tool Literacy

Early in the course, students were encouraged to grapple with automated information discovery through the use of RSS feeds, e-mail alerts, TOC alerts, and saved searches. These automated discovery techniques made it possible for students to work within their own schedule and to refine searches through result evaluation over time, and promoted ongoing information management techniques. The theme of tool use continued as students began to work with EndNote, the course wiki, and social software sites.

Resource Literacy

In many other information literacy courses, resource literacy is a central theme. By shifting away from traditional components such as complex searching, database-specific skills, and resource-centric retrieval methods to more general concepts such as information organization processes, how Google works, and the information timeline (Meriam Library 2007), students were encouraged to think more globally about the information discovery and retrieval process. When students focused their research on one of four large information literacy issues, they were encouraged to discover resources using a variety of free, fee, scholarly, and non-scholarly approaches.

Socio-Structural Literacy

The emerging interactive nature of the Web, information creation in a social context, and social software means that social participation in the creation of knowledge is a much more integrated component of knowledge today. It is with this purpose that

students were asked to reflect on their use of social network sites with an eye towards thinking about the use of categorization, knowledge building, search, discovery, management, and information privacy within the context of the course wiki.

Research Literacy

Two concepts were taught in relation to research literacy:

- Ideas such as the research/information seeking process and the information timeline were used to give students frameworks for approaching their work in the course.
- Research management applications were used to demonstrate techniques for using automation tools to enhance and simplify the research process.

Research management applications included a number of features such as the citation database, digital document storage, import/export functionality, note taking, and embedded citation ability. These functions allowed students to store information found during research, and permitted them to harvest this information in a number of ways, particularly during the paper creation process. While EndNote was the application of choice in this course, a number of other research management applications exist, including RefWorks, Procite and an open source application, Zotero (<http://www.zotero.org/>). Each of these applications has its own strengths and weaknesses but offers students the ability to engage with information management issues on an individual level.

Emerging Technology Literacy

Emerging technology was a key component of this course. Much has been made of the familiarity of Millennials with technology, but it became clear early on that these students had an imbalanced exposure to technology in which their experience was centered on popular culture technologies. By understanding that the underlying technologies in their social networking sites also exist in other

Web services (for example, RSS feeds), students were able to employ technology on a wider basis. This is one reason that wiki software was used as a learning platform. By using the wiki, students had the opportunity to work with popularly used social software and participate in the culture of publishing on the Web.

Critical Literacy

Evaluation is a critical component of information literacy courses. While the core ideas of evaluation, synthesis, and critical review have not changed, the specific questions that must be asked given various information formats are addressed by different criteria. By learning to think critically, not only about the information that they find but also about the alternative methods for locating traditional information, students become flexible information consumers.

A major drawback with the annotated bibliography final product used by most sections in the program related to the level of engagement. While students were allowed to select their own research topics, they were not required to complete the actual research for another course. This tended to result in superficial critical evaluation of the resources. By shifting the assignments to focus on applied research and class presentations, students were required to connect with the material and be prepared to discuss their findings with their classmates.

The Shapiro-Hughes model served as a foundation for making sure that the appropriate types of literacy instruction were included in the course. By framing modules around these themes, the instructors were able to create an environment which defines tangible objectives for course content.

Course Structure

In restructuring this course, and in keeping with the ACRL standards, our goals included the incorporation of technology that our students could use and understand to teach proper research and

citation methods. The class was designed around the concepts of group work and open academic collaboration. Some core tenets of this approach included open discussion, course content Web publishing, significant group participation, and a willingness to experiment.

This section contains a review of student responses during pre- and post course surveys, an overview of the course structure and wiki, discussion of course modules and student assignments, and a review of student work.

Course Learning Systems

At the center of the course was a wiki, to which both students and instructors contributed. The basic wiki served a similar purpose to Blackboard, housing the course syllabus, upcoming classes, and

assignments. We chose to use Blackboard to post grades, since it is a secure service, but that was its only purpose. Although 69% of the students had never used a wiki, over 88% of them believed that wikis could have a use in research.

This approach required some up-front learning by both students and instructors but ultimately facilitated

- ♦ easy collaboration and contribution to the syllabus and course materials by instructors
- ♦ embedding course content (Freemind files, YouTube videos, and Flickr pictures) into the wiki by instructors
- ♦ on-the-fly modification and revision of items by both students and instructors
- ♦ creation of a flexible, digital environment for students to create and submit assignments

Figure 1: Course Wiki
(http://wiki.zsr.wfu.edu/infolit/index.php/Lib100D_Spring2007/Main_Page)

The screenshot shows a web browser window displaying the Course Wiki page. The browser's address bar shows the URL: https://wiki.zsr.wfu.edu/infolit/index.php/Lib100D_Spring2007/Main_Page. The page header includes the Wake Forest University logo and the text 'Z. SMITH REYNOLDS LIBRARY wiki'. Below the header, there is a navigation menu with 'home', 'catalog', 'databases', and 'journals'. The main content area is titled 'LIB100D SPRING2007/MAIN PAGE' and contains a search box, a 'Personal tools' sidebar, and a 'Navigation' sidebar. The main text describes the site as a working area for issues in information and technology, and lists course content sections: 'Course Content', 'Broad Topics', 'Groups', 'Contact Information', and 'Readings and Links'. A note at the bottom states: 'Note: Grades will be posted in the Lib100_D Course in Blackboard.'

The use of a wiki was important because the traditional CMS typically does not allow instructors to easily collaborate on documents, revert to previous versions, or allow students to contribute to the course process. In the same vein, using a course wiki permitted students to:

- collaboratively build assignments
- engage in discussions in an electronic environment
- take ownership over course content and contribute back to the discussion
- take part in the creation of a Web content and knowledge building exercise

Because students had little previous experience creating or editing wiki pages, we spent half of a class session training the students on the use of the wiki. Student adoption of wiki editing appeared to be strong. They all successfully created and edited pages, and added links to other sites and documents. The authors believe that one reason that students used the wiki so extensively was that we decided to make the class paperless. All course materials, class exercises, and assignments were completed, evaluated, and returned to students electronically. This resulted in a great savings in time during grading and class time.

In addition to encouraging the students to use new information tools, the instructors used non-traditional tools for content presentation. In this course, Freemind mind-mapping software was chosen as an alternative to applications such as PowerPoint because it allowed rapid development and organization of class content, and did not emphasize a linear teaching style. Freemind is an XML-based concept mapping application that allows you to create a graphical representation of a mind-map. In addition, it provides the

- ability to embed images, hyperlinks, and digital objects
- ability to be displayed either within the Freemind application, as an html tree, or within a wiki using the Freemind MediaWiki Extension

- ability for instructors to assemble class materials and lecture notes into a single context-sensitive space

Given the ability of Freemind to create a student-browsable environment, students were able to access course materials at their own pace and easily target specific content areas.

Curricula Structure

The sixteen students were divided into four groups for the duration of the course. The instructors created a list of broad information literacy issues, put each in a hat, and asked each group to draw for the issue that they were to research for the extent of the class. The broad subject areas that were offered were:

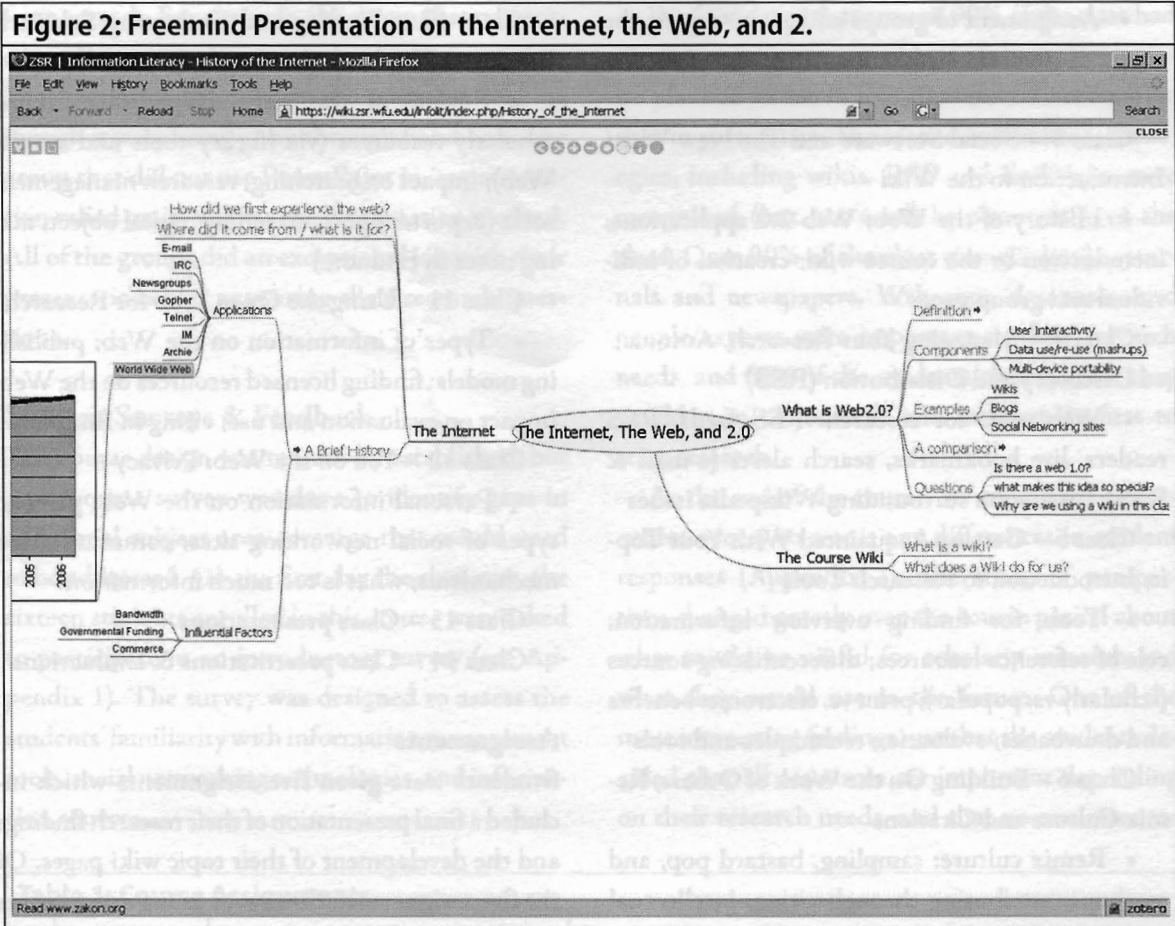
- social networking
- digital divide/net neutrality
- gaming in education
- Internet privacy
- identity theft

The four broad issues selected were narrowed to the following topics and questions by each group:

- Group 1: Privacy on Facebook: How does privacy affect future employment opportunities for the members on Facebook?
- Group 2: Ability to Apply to Colleges for High School Students: As more colleges and universities move toward online applications, how will the digital divide/net neutrality affect the application process for high school seniors?
- Group 3: Effects of Video Games in Education: How are video games used in education and what are the advantages of video game use to education?
- Group 4: Personal Information and E-commerce: What are the steps being taken by e-commerce businesses to keep personal information of consumers from being used for fraudulent purposes?

The course met two days a week for a total of fourteen fifty-minute sessions. The agenda for each class was posted on the wiki. Class discus-

Figure 2: Freemind Presentation on the Internet, the Web, and 2.



sions were organized around a Freemind presentation. This was an experimental approach, but became a very useful in-class tool. Since students were required to bring their university-issued laptops to class, each had access to the presentation mind maps during class. They took advantage of this access without being asked to do so, following along during the class with the mind map open on their own computers. We found that student access to the maps during the discussions led them to greater involvement with the wiki and class content.

Classes typically included an overview of the day's topic, class discussion, and an in-class exercise or group work time.

Course Modules

In redesigning the course, modules were shifted from format-based to literacies-based classes. This

meant that classes often included the common themes of discovery, access, and evaluation along with the introduction of a specific technology tool. For instance, scholarly resources were discussed within the context of content, not within the context of availability or print/electronic format. Because students were given the task of researching and presenting current information literacy issues, the coverage of this subject matter was left for the last two classes via group presentations. Following is a summary of the class modules:

Class 1 – What Is Information Literacy?/Initial Survey/Information Literacy Issues

- Overview of the course; ideas surrounding information literacy; overview of the course wiki; brief introduction to current issues in information literacy

Class 2 – Getting To a Research Question/The Research Process

- ♦ Assignment of groups and group topics; the research process; topic refinement; question creation

Class 3 – Social Software and The New Web/ Introduction to the Wiki

- ♦ History of the Web; Web 2.0 applications; introduction to the course wiki; creation of individual and group pages

Class 4 – Managing Your Research, Automated Discovery and Distribution (RSS)

- ♦ Web tools for research: RSS feeds, RSS readers, live bookmarks, search alerts (e-mail & RSS); discussion surrounding Wikipedia issues

Class 5 – Getting Acquainted With Your Topic, Introduction to Research Tools

- ♦ Tools for finding overview information; role of reference resources; differentiating sources (scholarly vs. popular); print vs. electronic: benefits and drawbacks; evaluation techniques and tools

Class 6 – Building On the Work of Others, Remix Culture and Citations

- ♦ Remix culture: sampling, bastard pop, and mashups; attributing through citing; intellectual property

Class 7 – Research Management Applications, Introduction to Endnote

- ♦ Configure EndNote, learn basics of building citations and managing references, introduction to Cite While You Write

Class 8 – Knowledge Organization and Searching

- ♦ Discussion of organization methods; comparison of controlled vocabularies vs. folksonomies; relationship to discovery; discussion of popular discovery tool features (in Amazon, Google, and licensed databases); exercise using Flickr to describe and retrieve pictures

Class 9 – Finding and Evaluating Scholarly Resources I

- ♦ Types of library resources (books, journals); scholarly vs. popular; discovery tools; third party tools (Amazon, Google/Google Books, Worldcat.org)

Class 10 – Finding and Evaluating Scholarly Resources II

- ♦ Review of the research process; finding scholarly resources (via library tools and on the Web); impact on searching; research management tools (export/import, attaching digital object, taking notes in Endnote)

Class 11 – Using the Open Web for Research

- ♦ Types of information on the Web; publishing models; finding licensed resources on the Web; impact on evaluation and use; citing in EndNote

Class 12 – You on the Web: Privacy

- ♦ Personal information on the Web; privacy; types of social networking sites; communication mechanisms; what is too much information?

Class 13 – Class presentations

Class 14 – Class presentations & Evaluations

Assignments

Students were given five assignments which included a final presentation of their research findings and the development of their topic wiki pages. Of the five assignments, three were group assignments and two were individual assignments.

An effort was made throughout the course to de-emphasize the format of resources and emphasize their utility. It seemed inappropriate to require students to find a set number of books, journal articles, and Web sites when the relationship and use of specific formats varies from topic to topic. We saw this as one of the shortfalls of the annotated bibliography assignment that was previously used as the culminating project.

On the last two days of the course, the groups presented their research findings. They were given twenty minutes in front of the class and were told that they could choose any presentation method that they would like. Each member of the group was asked to take on a speaking role of some sort. The group was also asked to show its wiki pages and a list of its properly cited resources. Three of the four groups used PowerPoint to present their research findings, creating PowerPoint templates

from scratch. For example, the group that presented on Privacy on Facebook developed a template in PowerPoint to make its presentation look as though it were being given through Facebook. The group that did not use PowerPoint in its presentation relied on its wiki as the presentation method. All of the groups did an exceptional job with their presentations and answering their research questions.

Student Surveys & Feedback

The course design was tentatively established, but a pre-course survey was done to identify gaps in additional subject area coverage that would need to be addressed. On the first day the class met, the sixteen students enrolled in this course were asked to participate in an introductory survey (see Appendix 1). The survey was designed to assess the students' familiarity with information management tools, social networking technologies, and information sources.

We found that around 90% of the class had regular or frequent use of half of the technologies we planned to use in this class (social networking sites in particular). The second half of the technologies, including wikis, RSS and EndNote, were recognized (but not used) by about 60% of the class. Over 90% of the class thought books, journals and newspapers, Web sites, databases, and people/experts were important to their research needs, and 69% of the students claimed that they would turn to journals and newspapers first to start research.

At the end of the course, we conducted a post-course survey to assess any differences in student responses (Appendix 2). The students' perspectives changed greatly over the course period about what would be useful for scholarly research and what they would use in the future. One of the most interesting findings was that the students decided that all resources are important depending on their research needs, and that no one resource

Table 1: Course Assignments

	Type	Goal	Producible
1	Group	Narrow the broad topic assigned to the group and formulate a research question	Create a wiki page which includes the narrowed topic and research question along with supporting materials
2	Group	Discover introductory material to support the group research question and define the parameters of the investigation	Enhance the wiki page created in assignment 1 with supporting background and scope information. Include a list of consulted resources
3	Individual	Become familiar with discovering, accessing, and evaluating licensed scholarly resources	Create a wiki page which presents the resource selected along with a critique of the resource and its relation to the group research question. Create an entry in EndNote, export it in APA style into Word; upload the Word document with the exported citation to the wiki
4	Individual	Become familiar with discovering, accessing, and evaluating openly accessible scholarly resources	Create a wiki page which presents the resource selected along with a critique of the resource and its relation to the group research question. Create an entry in EndNote, export it in APA style into Word; upload the Word document with the exported citation to the wiki
5	Group/ Individual	Become comfortable with being a collaborative researcher and participating in the creation of information in a social software environment	Present findings from research to class, edit and organize wiki pages to represent a cohesive answer to the research question

stood out as most important. Also, the students indicated that they preferred the use of the wiki over Blackboard as the course delivery system.

Along with our post-course survey, students were asked to complete a course evaluation administered for the University. Our students indicated that the aspects they found most valuable were the use of EndNote and the wiki. They liked having the course material online and accessible at all times. Additionally, they enjoyed contributing to the class through the wiki. They also appreciated learning how to evaluate resources and determining whether something was scholarly. Some of our students did not enjoy group work and would have preferred to create wiki entries as individuals. This was not unexpected, since not all students like group work. All indicated they would recommend this specific class to others. One student even indicated that his job requires the use of a wiki, and that he now feels more comfortable with this technology because of our class.

When comparing our survey results to other sections of the information literacy courses that were taught during the spring semester of 2007, most students found the technology aspects of the classes taught most useful (EndNote, wiki), along with classes involving searching, use, and evaluation of online resources. Students deemed least useful classes to be those involving books and print resources, how to locate resources in the library, how to use the catalog, and how resources in the library are organized by call number.

Future Plans

While it proved difficult to compare student achievement between this information literacy class and others offered at the university, we plan to design a quantitative study over the next academic year. The results of this study will be posted on the post-publication wiki that supplements this book.

The successes identified in this new approach are being adopted in part by other instructors in our library's information literacy program:

- incorporation of a wiki to replace Blackboard
- structuring group work as a component of course assessment
- movement from manual citation to an automated method
- change of final project from annotated bibliography to a research essay and presentation

Other social software applications are being investigated for their potential use in this course. One course section is looking at blogging software as a discussion forum while others are exploring alternative electronic citation methods. The instructors are also evaluating scholarly resource tagging sites such as CiteULike (<http://www.citeulike.org/>) as a method for collaborative resource gathering.

Conclusion

This class contained a number of new educational methods and included substantial new content. Student and instructor feedback was overall positive but also indicated the need for improvement in a few areas.

- Balance class time between learning technology tools, investigating research skills, and participating in collaborative work.
- Build additional student presentations into earlier class discussion. Have students present an overview of their research question during one of the first few class sessions.

Shifting from the annotated bibliography project, which tended to be resource driven, to a research and report project which emphasized discovery, access, and evaluation skills, produced better overall projects and resulted in more student participation in the course. Further, by utilizing group work and allowing the students free reign over the specifics of content, format, and work assignments, we found that groups collaborated together to fill in each others' knowledge gaps.

In attempting to approach information literacy from a Library 2.0 framework, the authors found that employing constructivist teaching methods

and social software created a classroom environment that was more effective at delivering information literacy skills. In short, the Library 2.0 information literacy classroom:

- ♦ creates an information literate person who has technical and evaluation skills which can be re-used in changing information environments
- ♦ creates an environment where there is no “correct” approach to discovering, evaluating, and managing information; solutions are as personal and unique as our students and patrons
- ♦ dispels the notion that technology is a separate component of information; students should grapple with technology as part of their information literacy process because doing so enables

them to find new paths through information

- ♦ creates an information literate person who is capable of employing inter-disciplinary and diverse approaches to information seeking and who can apply critical and evaluative frameworks to information based on the required need and origination

If nothing else, a Library 2.0 focused information literacy course should reflect the information environment that we are trying to teach. The goal of creating information literate students is more easily met when the tools and approaches are embedded in every aspect of the course from the syllabus to assignment creation and professor/student communication.

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Appendix 1: Pre-Course Survey

1. To what extent are you familiar with/have used the following information management tools?
 - a. Wikis
 - b. Blogs
 - c. RSS Feeds
 - d. Bibliographic Management Software
 - e. Podcasts
 - f. Facebook/MySpace (social Web sites)
 - g. Text Messaging
 - h. E-mail

2. Which of the following technologies do you think have use for research?
 - a. Wikis
 - b. Blogs
 - c. RSS Feeds
 - d. Bibliographic Management Software
 - e. Podcasts
 - f. Facebook/MySpace (social Web sites)
 - g. Text Messaging
 - h. E-mail

3. Rank the order of importance these tools in terms of your research.
 - a. Books
 - b. Journals/Newspapers
 - c. Web sites
 - d. Databases
 - e. People/Experts
 - f. TV
 - g. Radio
 - h. Other Sources

4. In beginning your research which information resources are you most likely to turn to first?
 - a. Books
 - b. Journals/Newspapers
 - c. Web sites
 - d. Databases
 - e. People/Experts
 - f. TV
 - g. Radio

Other, please specify Appendix 2: Post Course Survey

1. Indicate the extent to which you will continue to use the following resources:
 - a. RSS Feeds
 - b. Search Alerts
 - c. EndNote
 - d. Wikis
 - e. Blogs
 - f. Find a Journal
 - g. Find a Database
 - h. WFU Full Text Options
 - i. Library Subscription Databases
 - j. Library Online Catalog
 - k. Web Search Engines (ie Google, Yahoo!)
 - l. Web Accessed Information (ie resource reviews, Wikipedia articles)

2. Based on your experience in this class, rank the importance of the following skills
 - a. Finding search terms
 - b. Ability to write good citations
 - c. Understanding of Library of Congress Classification System
 - d. Familiarity with ZSR Library
 - e. Performing comprehensive searches
 - f. Automating research via search alerts/RSS feeds
 - g. Managing research references in EndNote
 - h. Using print resources
 - i. Using electronic resources
 - j. Using social network sites (Facebook, Flickr)
 - k. Knowledge of emerging technologies
 - l. Familiarity with Information Literacy issues
 - m. Ability to distinguish types of resources (books, journals, Web sites, etc)
 - n. An understanding of the research process
 - o. Ability to evaluate information resources

3. Rank the order of importance of these tools in terms of your research
 - a. Books
 - b. Journals/Newspapers
 - c. Web sites
 - d. Databases
 - e. People/Experts
 - f. TV
 - g. Radio
 - h. Other sources

4. When beginning your research, which information source(s) are you most likely to turn to first
 - a. Books

- b. Journals/Newspapers
 - c. Web sites
 - d. Databases
 - e. People/Experts
 - f. TV
 - g. Radio
 - h. Other sources
5. Based on your experience with the wiki in this course and Blackboard in other courses, which course tool would you rather use?
- a. Blackboard
 - b. Course wiki
6. What did you think about using the wiki to create and submit assignments?
7. If you have a preference between the Course wiki and Blackboard, can you tell us why you would prefer one tool over the other?
8. Did you ever use other student generated content in class to help guide your own work? (Yes or No)
9. Rate the usefulness of the class topics
- a. Definition of Information Literacy
 - b. Orientation to class wiki
 - c. Defining the research process
 - d. Selecting and Refining a research question
 - e. History of the Internet
 - f. Overview of Web 2.0
 - g. E-mail Alerts/RSS Feeds
 - h. Resource Evaluation
 - i. Differentiating scholarly and popular resources
 - j. Finding Web resources
 - k. Remix culture and citations
 - l. Using Endnote
 - m. Information Organization / searching
 - n. Using library tools to find resources (online catalog, Find a Journal, Find a Database, WFU Full Text Options)
 - o. Privacy Issues
 - p. Presentation of group research findings
10. Do you have other comments or suggestions for future courses?