Interdisciplinary Lesson Study:
Communication Studies and Library Information Literacy Program

PART I: OVERVIEW

Title: Teaching Library Information Literacy Skills to Students Enrolled in an Introductory Communication Course: A Collaborative Study

Discipline or Field: Communication Studies and Library and Information Studies

Authors: Galadriel Chilton (Library), Michael Current (Library), Jenifer Holman (Library), Cristine Prucha (Library), James Putz (Communication Studies), Thomas Reinert (Communication Studies), University of Wisconsin-La Crosse; Becky Belter (Communication Studies), Jackson Community College

Contact: Jim Putz putz.jame@uwlax.edu or Cristine Prucha prucha.cris@uwlax.edu

Course Name: Public Oral Communication

Background

Communication Studies 110, Public Oral Communication, is part of the General Education program at the University of Wisconsin-La Crosse. According to the UW-L Undergraduate Catalog, "General Education is the common educational experience for all undergraduates at UW-L. The primary purpose of General Education is to cultivate knowledge, skills, and dispositions essential for independent learning and thinking."

CST 110 is required of all UW-L students and students usually take this course during their first academic year. UW-L offers 48 sections of CST 110 during the fall semester and 36 sections during the spring semester. Each section usually has 25 students, usually in their first or second semester of college.

The CST 110 Common Syllabus states that "as a student in CST 110 you will develop oral communication skills," including "being able to locate sources of information in the library and use these sources to develop your presentation." The syllabus also specifies that "each section (of CST 110) will visit Murphy Library for a library orientation exercise." During an academic year, librarians provide information literacy instruction to approximately 2,100 CST 110 students.

Instructors utilize a variety of teaching/learning situations in CST 110 classes, i.e., working in groups, or in-class writing exercises. Working in groups is a form of cooperative or collaborative learning. Cooperative learning "provides opportunities for students to talk and listen, read, write, and reflect as they approach course content through problem-solving exercises, informal small groups, simulations, case studies, role playing, and other activities --- all of which require students to apply what they are learning" (Myers & Jones, 1993, p. xi).

Prior to our lesson study, librarians used a template or sample presentation when teaching CST 110. These lecture-based presentations, however, varied both in content and in instruction methods. While some librarians incorporated active learning techniques, others did not. Both the director of the CST 110 program and the coordinator of the library's information literacy instruction program felt that more consistent use of collaborative learning techniques would improve the effectiveness of the lesson.

At a Lesson Study Project informational meeting in 2004, the coordinator of the library's information literacy program talked to the director of the CST 110 program about developing a lesson study team to evaluate and redesign the CST 110 library exercise. One goal of the lesson redesign would be to incorporate more collaborative learning experiences. Five librarians and four CST 110 instructors met for the first time in January 2005 to create a lesson that librarians could use to teach all sections of CST 110.

Executive Summary

Our interdisciplinary lesson study group developed a collaborative learning experience designed to introduce CST110 students to library resources and research skills. The lesson was both interactive and hands-on. It was intended to serve as the model or template for all librarians to use when providing information literacy instruction for CST 110 classes. It included general library information, instruction about, and hands-on experience with, several library databases, exercises in evaluating resource credibility, and exercises in generating American Psychological Association (APA) style citations from several library databases. We utilized the new lesson for the first time on February 8, 2006.

Learning Goals

Our primary goal for the lesson was to ensure that CST110 students gained proficiency in basic research skills, including the use of library services and resources. Specifically, we wanted students to be able to:
- choose appropriate library databases for a research question (navigate the library website)
- efficiently search library databases (use basic search principles)
- understand how to use library databases to identify and retrieve books, print periodicals, and electronic periodicals
- discern the credibility of sources
- format APA-style citations

Lesson Design

Librarians and communications studies faculty designed the lesson to mimic the research process, taking students though the steps necessary to conduct quality research. In order to engage the students in learning we incorporated collaborative learning techniques, including a series of interactive questions that each group answered. The questions sometimes required a verbal response, and sometimes required a written response from each group. We also utilized a worksheet to help focus student attention.

Groups of three to four students shared a computer and completed tasks together. Collaborative learning serves a pragmatic purpose, as it keeps the class together, rather than having some individuals jump ahead or work on non-related web browsing. As Smith reported in his 2004 study on collaborative learning, the quality of the work increases with collaborative learning**:**

"In a meta-analysis of 122 studies involving 11,317 learners, Yiping, Abrami, and d'Apollonia concluded that 'when working with computer technology in small groups, students in general produced substantially better group products than individual products and they also gained more individual knowledge than those learning with computer technology individually'" (2001, 476 in Smith, 2004).

Each group member had his or her own worksheet referred to as a "research log." Librarians designed the worksheet to provide a:

- Lesson outline that would aid students' processing of new information
- Guide for group activities
- Model framework for completing the research process
- Personal, customized job aid that students could use outside of class

Class outlines and worksheets with keywords from the lesson help students focus their attention rather than dividing their limited short-term memory between the instructor and note taking.

Research by Kiewra and others (as cited by deWinstanley and Bjork, 2002) suggests that when instructors provide students with an outline or worksheet for note taking, students' note quality, performance, and lecture recall improve.

In addition to keeping in-class performance on track and helping students' process new information, the CST 110 worksheet is also a job aid. Job aids are "repository[ies] for information, processes, or perspectives that are external to the individual and that supports work…by directing, guiding, and enlightening performance" when a need arises (Rossett & Gautier-Downes, 1991). Many students who come to the library with their CST 110 class have not yet selected a topic for their assignments. Therefore, when students are working on their research outside of class or in future classes, their worksheet – a customized job aid – directs and guides their search for information.

Major Findings About Student Learning

Analysis of student behavior observed during the lesson indicated that:
- The worksheet questions, coupled with librarian interaction with individual groups, resulted in successful learning of searching techniques.
- Student searches observed during the class indicated that material introduced only through lecture was not learned as successfully.
- Students were particularly excited to learn how to use database features to automatically format APA style citations.

Students perceived the lesson to be effective in improving their ability to use information resources. However, we did not ask for their perceptions about specific research skills. After the library lesson, the CST 110 instructor recognized that the students located and cited more credible information to support their speeches. Students were also able to use proper citations in their bibliographies. The instructor reported that students expressed that they felt more comfortable using available library resources.

After the lesson the librarians recognized shortcomings in their standard assessment instrument, and planned to implement improvements. In addition, they recognized the continuing need to collaborate with CST instructors to evaluate the efficacy of the CST 110 library lesson.

PART II: THE LESSON

Pre-Lesson

Step One
- Prepare for the Lesson
- Materials needed - Make copies of student worksheet for the lesson
- Review the Research Lesson PowerPoint and make any changes need
- Set up the Library Introduction to run ten minutes prior to class. This Windows Media Video file runs in a continuous loop prior to class so that students who arrive early can learn about the library before the class begins. The film contains photos of library locations and questions and answers about library services in a format similar to trivia questions shown prior to film in a movie theater.
- Librarian makes sure that as students arrive, that they sit in groups of 3-4 at eight tables designed for collaborative learning

The Lesson

Step Two: Introduction
- Instructor introduces librarian.
- Librarian introduces the topic of library tools for presentations

- Group Activity (Slide 2) – Answer this question as a group and be prepared to discuss: When Conducting Research…What do you do first?
- Search the web
- Search library databases
- Ask for help at the Reference Desk
- Call your parents for help
- Ask your friends for ideas
- Whole Class Discussion
  Librarian polls groups for their answer to the question. Librarian explains that there are no wrong answers. Librarian discusses the web as a place to start, to get a clue, but not an acceptable place to finish. Librarian asks students to explain why their professors may not accept Wikipedia as a source for a paper or presentation. Librarian explains that library databases are indexes to professional literature and that when students graduate they will be expected to be conversant with the professional databases of their field. (Example: ERIC for education majors, PsycINFO for psychology majors, etc. Librarian introduces the Reference Desk as resource and a fine approach to beginning library research.

Step Three: The Research Process
- Librarian introduces the steps in research – Research Mountain PowerPoint slide
- Librarian explains that research is a process. Students may want to begin with background information and then search for newspaper articles to get brief current information, followed by magazines or scholarly articles for more in depth information. Finally, statistics and quotes may be a way to engage the audience's attention. The library offers specific resources for finding all of these things.

Step Four: Establish & Explain Groups
- Establish groups and introduce worksheet
- Librarian explains the research log
- Librarian gives groups half a minute to introduce themselves and assign the roles of "Group Navigator (keyboardist), Communications Controller, and Polite Backseat Drivers (co-navigators). Students introduce themselves within their groups and assign roles.

Step Five: Vocabulary
- Introduce the importance of vocabulary in searching databases
- Group Exploration 1 (research log) - Brainstorm keywords for the lesson's simulated research task - research for a speech on human rights
- Whole Class Discussion (2 minutes)
- Librarian asks each group to share one word with the whole class, that they wrote down related to the topic of human rights, trying to avoid repetition. One student from each group shares a word. Librarian explains that "human rights" is a huge topic with narrower subtopics. Librarian explains that different databases use different language to refer to the same topics and that when librarians trouble shoot unsuccessful searches one of the first things they do is to consider the search terms and try to suggest other terms that might be more successful. Librarian points out that abstracts and subject headings yield suggestions for different search terms.

Step Six: Library website
- Librarian introduces the topic of the library website as the base camp
- Librarian asks each group to open up the library website. Librarian points out key links such as the library catalog for books, article databases also known as indexes to periodical articles, the Periodicals Holdings List where we can find out if we have access to a journal either in the library or electronically through a database, and the link to information on citing sources.

Step Seven: Article Databases and GeTeXt

- Librarian introduces concept of library subscriptions to article databases with different subject focuses – professional databases for those in the field.
- Librarian introduces concept of GetTeXt as the library's attempt to connect the different unrelated databases so that students can be aware of all possible access points to periodicals.
- Group Activity (Slide 9) - Answer this question as a group and be prepared to discuss: Which of the following describes characteristics of an article database?
- The library pays a subscription fee for the database so that UW-L students can use it.
- The web provides the same information as library databases, plus more.
- The article databases Murphy Library provides, index only the periodicals, which Murphy Library owns.
- Whole Class Discussion
  Librarian asks each group to share their answer with the class. Librarian explains that subscription databases are not freely available on the web, and that professionals throughout the world use them.

Step Eight: Evaluative Thinking

- Librarian introduces concept of using database features to evaluate the credibility of online articles.
- Group Exploration 2, Evaluative Thinking (research log) – Students use links in Academic Search Premier to evaluate an article (find author's publishing history, find journal's peer-reviewed status)

Step Nine: Online Searching Principles and Specifics

- Librarian discusses Online Searching Principles and refers to page 4 of the Research Log.
- Group Activity (Slide 14) - Answer this question as a group and be prepared to discuss: Which search tactics will _broaden_ your search, yielding _more_ results?
  - NOT
  - Truncation
  - AND
- Whole Class Discussion
  Librarian asks each group to share their answer with the class, and clarifies any wrong answers. AND narrows search results, requiring both concepts to be present such as women and Iraq. Librarian explains that truncation was not discussed in class but is explained on the handout. Librarian explains that nurs* in Academic Search Premier will yield records for nurse, nurses, and nursing.

Step Ten: Library Catalog

- Librarian models linking to the library catalog from the library home page
- Group exploration 3, Search the Library Catalog (research log) – Students use the Catalog to find a book on human rights and record location, call number, and availability. Students also find a book in the _Opposing Viewpoints_ series on the topic of human rights.
- Librarian circulates among the groups, reminding them to use quotations around the phrases "human rights" and "opposing viewpoints." Librarian also reminds students to check the chart on their handout where they will find that to conduct a Boolean AND search to combine two concepts they must select Boolean from the drop down Search Type menu. Librarian demonstrates a Boolean search for "opposing viewpoints" AND "human rights." Librarian and class instructor explain the importance of books in the _Opposing Viewpoints_ series to students planning presentations.

Step Eleven: Exploring Article Databases

- Librarian models linking to article databases from the library home page

- Group explorations 4-7 (research log) – Students use CQ Researcher, Newspapers ProQuest & Newspaper Source, Academic Search Premier and CrossSearch to answer questions on the Research Log.
- Librarian circulates among groups to answer questions and offer suggestions.
- Librarian demonstrates any problem areas for the whole group as needed.

Step Twelve: Exploring GeTeXt
- Librarian introduces an example of detailed periodicals holdings information from GeTeXt.
- Group Activity (Slide 18) - Answer this question as a group and be prepared to discuss: GetTeXt – What's Next? Should you…
  - Find the article on microfilm in the library or by linking to EBSCO*host* Electronic Journals Service
  - Find the article in the Periodicals Bound stacks in the library or by linking to EBSCO*host* Electronic Journals Service
  - Request the article through ILLiad
- Librarian asks each group to share their answer with the class and clarifies any wrong answers.
- Group Activity (Slide 20) - Answer this question as a group and be prepared to discuss: No Full text. What's Next?
  How could you get the article?
  - Check a different library database for the article
  - Go to the Public Library
  - Request the article through ILLiad
  - Check the Periodicals Bound stacks
- Librarian asks each group to share their answer with the class and clarifies any wrong answers

Step Thirteen: Library Resources for Statistics and Quotations
- Librarian introduces sources for statistics and quotations.

Step Fourteen: Characteristics of Scholarly Publications
- Librarian introduces concept of scholarly and popular types of publications and the need to use scholarly sources
- Group Exploration 8 (research log) – Students evaluate the journal given to their group and decide if it is peer reviewed or popular.
- Librarian asks students to identify the characteristics of a scholarly article (abstract, references, credentials of author.) Librarian points ways to determine if a journal is peer reviewed.

PART III: THE STUDY

Approach

Our data collection involved several forms of evidence:

1. *Filmed observations of students*
   Before the presentation students signed forms giving consent to be filmed. A videographer was present for the lesson, and filmed during the entire presentation of the lesson. Filming focused on a number of individuals and groups of students as the camera operator shifted the location of the camera from time to time while a librarian taught the lesson. The videographer provided the lesson study team with a DVD of the class for review.

2. *Written observations of students*
   Several members of the study team were present for the purpose of recording their observations of students engaged in the lesson. The observers used standardized

observation sheets to record their responses. These observers stayed fixed in place around the perimeter of the classroom, so that their observations were of the same groups of students. This also permitted their presence to be as minimally distracting for the students as possible.

3. *Classroom responses*
The lesson incorporated several opportunities for soliciting feedback from the students, designed to determine whether they had successfully assimilated information just presented. If the TurningPoint technology had been in place and functional as intended, the student responses to these questions would have been automatically recorded for later analysis. However, due to technical difficulties, the TurningPoint system was not available, so students provided in-class feedback by show of hands.

4. *Student evaluations*
At the conclusion of the lesson, the instructor asked the students to evaluate the lesson by completing an online evaluation form. Students were asked to indicate if the library instruction session improved their ability to use library resources. They were also asked to record the two most important things they learned.

5. *Instructor evaluations*
Lists of sources developed by the students as components of later class assignments for the CST110 class instructor were another form of evidence collected and evaluated. The format of the citations used in listing these sources is also evidence of students' ability to determine and utilize proper citation formats.

Findings

Analysis of Filmed and Written Observations

In general, students appeared to learn the material presented. This was manifested in their ability to successfully complete the group exploration components of the lesson during the class. Their success with the exercises demonstrated their ability to select appropriate library databases and efficiently search them to retrieve books and articles.

The collaborative learning design for the lesson was inconsistently successful in engaging all members of each group in tasks. Some students appeared passive throughout the lesson, and occasionally some of the groups did not participate when the instructor asked groups to respond to questions. Frequently, the student acting as keyboardist led the group by deciding what to do and how to do it, while the other students in the group sat back. Most often, observers noted this passivity while the instructor was introducing a new resource to the entire class. However, observers also noted positive interaction between group members, including many instances of students correcting each other and helping each other to keep up with the pace of the lesson.

Additionally:

1. Visibility impediments detracted from students' ability to stay focused on the lesson. Students in the back of room had a hard time seeing the presentation screen. In addition, the presenter sometimes blocked a portion of the screen.

2. Students appeared to have difficulty in organizing into working groups.

3. Students appeared to be bored by the Search Survival portion of the lesson. The perceived importance of this material may have been affected by the presence of the information on the handout.

4. Students had a difficult time reading and interpreting the slide presenting the GetTeXt screen.

5. Some students appeared to be frustrated by the limited amount of time allocated for several of the hands-on exercises.

6. Once the librarian organized the students into groups, they seemed to expect to work immediately on group tasks, and they seemed less focused on the lecture format.

7. Group tasks that involved using a database's built in tool to automatically format APA style citations for selected articles especially engaged students.

Classroom Responses

In circulating among groups, the librarian observed most students making fundamental errors in library catalog searches, such as not putting phrases in quotes, and not selecting the Boolean search type to connect ideas.

We had planned to use TurningPoint technology to automatically record student responses to the quiz questions embedded in the lesson. However, the TurningPoint system was not functioning, so students provided in-class feedback by show of hands. We considered this less effective as a measure of student learning because students could be influenced by the responses of other groups. Consequently, we did not record student responses to the in-class questions.

Analysis of Student Evaluation Data

1. Students indicated that the library instruction session improved their ability to use information resources. The average score in response to this question was 3.9 on a 5-point Likert scale, with 10 students indicating "Agree" and 3 students indicating "Strongly Agree." Questions on the form did not address whether students learned specific research skills.

2. While the CST110 library lesson was re-invented for this lesson study, a version of the lesson was already in use in years past. The same student evaluation form was used in past years as well. Looking again at student responses to the statement, "The library instruction session improved my ability to use information resources," The average score from CST110 library lessons given in spring 2005 by the same librarian who gave the February 2006 lesson study session was 3.73. This is somewhat lower than the 3.9 score on the same question from the February 2006 lesson study session. While the statistical significance of this difference is questionable, it does suggest that students may perceive the new lesson to be more effective that the old.

3. In response to the open-ended question asking them to report the two most important things they learned, a significant number of students reported they had learned about citing sources.

4. Analysis of Instructor Evaluations
    The CST110 instructor reported that subsequent to experiencing this lesson, students were usually successful in finding, incorporating, and properly citing appropriate library information resources in their class work.

Discussion

The purpose of this study was to introduce CST 110 students to resources found in the Murphy Library, to help them discern the quality of the sources that they would use in developing oral presentations for their class, and to learn appropriate use of the APA source citation format. The APA format is the citation style that the communications studies discipline recommends.

The lesson study team predicted that the lesson would provide the foundation for tools the students would need, not only in their current oral presentation classes, but also throughout their college careers. Team members also predicted that the quality of sources and source citations the students used as they developed their individual oral presentations would be enhanced. Evaluation of the outcomes of the lesson study supported these predictions.

The lesson used affected changes in students understanding of the library's resources and skills in using those resources in the following six key areas:

1. Students became familiar with the library's home page, and learned how to access the various links to other library resources. Since the majority of the students were new to the campus, they had little previous knowledge of the physical library or its resources. The library's home page provides them with information regarding the physical layout of the library as well as links to the various online resources available in or through the

library. During the lesson study, student groups participated in exercises that not only challenged them to locate a variety of library materials, but also simulated an ideal research process.

2. The student groups gained practice navigating various article databases. Students had the opportunity to use a variety of search techniques to expand or focus their search for resources. Students would later use these techniques as they developed their assigned presentations in the classroom.

3. Students gained an understanding of the connections that exist between databases to which the library subscribes. This part of the lesson plan explained how custom text or buttons attached to article citations explain library holdings and provide links to other databases or library services (i.e. ILLiad) as means of acquiring article text.

4. Students learned methods they can employ to determine the difference between popular and peer reviewed sources. The lesson challenged student groups to determine if materials assigned to them would be considered popular or peer reviewed. This exercise would be helpful to them as they selected appropriate supporting materials for their classroom presentations.

5. Students learned that library databases are available from any computer with an Internet connection, and how students could e-mail, print, and save articles retrieved from library databases.

6. Students gained an understanding of the methods needed to created proper APA style citations in their bibliographies.

The design of the lesson and the complexity of the group explorations gave the librarian enough time to circulate among the groups and observe and correct search techniques. The librarian observed many groups searching ineffectively and was able to offer suggestions to correct students' search strategies. The library catalog exploration was particularly difficult for the students.

Prior to the lesson, the CST 110 instructor reported that some students felt that they already knew about the library and how to use library resources. After the lesson, however, the instructor noted that many students expressed surprise at the amount of available information in the library. The lack of understanding about how to use a college library and "tap into" the numerous databases may reflect student reluctance to show a lack of understanding about using an academic library. Polkinghorn (1983) stated that "the knower is central to the research" (i.e., students and instructors are the participants in the study and respond according to their perception of the classroom lesson).

Therefore, the lesson study team evaluated the effectiveness of the lesson from a number of perspectives:

1. *Structured group work*
   The effectiveness of the groups depended upon the individual student's willingness to participate in the exercises. Given that the lesson was presented early in the semester and many of the students were freshmen, some students may have been reluctant to offer suggestions during the search for resources, even in small groups. However, the lesson did provide valuable information for all of the students. Therefore, the lesson was successful in achieving its goal.

2. *Presenter's influence*
   Although a great deal of planning went into the development of the lesson, we discovered that an individual presenter's method of delivery and approach to the lesson might have an effect on how the lesson is shared. Since the lesson is being delivered extemporaneously, this suggests that when given, the lesson may be "modified" in terms of pace and emphasis on specific content as determined by the presenter.

3. *Observer feedback*
   Since the interpersonal dynamics of each group of students varied, what the observers

experienced and their reaction to the success of the lesson was different for each observer. However, all observers noted valuable information that contributed to the evaluation and modification of the lesson.

4. *CST 110 Instructor feedback*
   Instructors have consistently praised the librarians' effectiveness in providing information for the lesson. Clearly, students' ability to provide quality resources to support their presentations is evident. The breath, depth, and quality of sources students use after the lesson are related to successful learning in the library lesson. Not only did the quality of the sources used by the students improve, written evidence also demonstrated their ability to cite their sources properly using APA format.

We plan a number of changes to the lesson in direct response to our findings. These include:

1. Remove the Research Mountain slide, in order to reduce content delivered in lecture format and increase time available for group work.

2. Delay the opportunity to organize into groups until immediately before the first group exercise.

3. Adjust many slides, especially the Base Camp, so that most of the content is displayed higher on the slide, in order to overcome some of the visibility issues.

4. Replace the GetTeXt responder question with a GeTeXt group exploration, and place this exercise as the first exploration.

5. Reduce the Search Survival material from two slides plus a responder question to a single slide that references the material on the Research Log handout, plus a responder question.

6. Add an additional group exploration devoted to forming APA style citations.

The student evaluation form utilized in this lesson study is the standard form used to generate student assessment data for most of the library's information literacy instruction sessions. We plan to institute the following enhancements to our library instruction assessment procedures in order to address shortcomings in the level of detail about specific research skills:

- Librarians plan to change the student evaluation form used for all information literacy instruction sessions to include questions about specific learning outcomes.
- In collaboration with one or two CST 110 instructors who currently utilize a pre and post test for their CST110 sections, create questions that will assess students' research skills and use one or two classes to collect sample data.
- In collaboration with one or two CST 110 instructors, gather and evaluate a sample of the student bibliographies that are a required component of CST110 assignments.
- Collect a sample of research logs from library instruction sessions and evaluate student responses to questions on the worksheet.

Our lesson will remain a work in progress indefinitely. Environmental factors that will necessitate continual enhancing of this lesson include the following:

1. Some sections of CST 110 are fifty-five minutes long while others are eighty-five minutes in length. Further evaluation and modification of the lesson should provide a focus on which elements should be included in every session given, and what elements may be reduced or eliminated when giving the lesson in the shorter time allocation.

2. Many different librarians, each with their own style and approach to instruction, will utilize this lesson. We should identify those elements of this lesson that are required, and also where there this lesson allows for flexibility for librarians to experiment or otherwise stray from the lesson as developed.

3. Library information resources and technologies change frequently. This requires the material covered in a library lesson such as this to be updated frequently as well, possibly every semester. For example, since we used this lesson in February 2006, Murphy Library

has de-emphasized the CrossSearch product, and no longer offers the FactSearch reference database, so those two products will no longer be included in this lesson.

4. The curriculum for the CST 110 course is revised regularly. This clearly may impact the learning goals of the library lesson.

This lesson study has been productive for both librarians and CST 110 instructors. A large, interdisciplinary group faces many unique challenges. Our experience underscores the importance of close communication in order to achieve our mutual goals for student learning. Our collaborative work on the CST 110 library lesson will continue.

References

CST110 Common Course Syllabus. (2006, August). La Crosse, WI: University of Wisconsin-La Crosse.

deWinstanley, P. A. & Bjork, R. A. (2002). "Successful lecturing: Presenting information in ways that engage effective processing. In Halpern, D. F., & Hakel, M. D. (Eds.), Applying the Science of Learning to University Teaching and Beyond. New Directions for Teaching and Learning. 89. (pp. 19-31) New York: Jossey-Bass.

Meyers, C., & Jones, T. B. (1993). Promoting active learning: Strategies for the college classroom. San Francisco, CA: Jossey-Bass.

Polkinghorne, D. (1983). Methodology for the human sciences: Systems of inquiry. Albany, NY: SUNY Press.

Rossett, A. & Gautier-Downes, J. (1991). A Handbook of Job Aids. San Diego: Pfeiffer & Company.

Smith, S. A. (2004). Designing Collaborative Learning Experiences for Library Computer Classrooms. College & Undergraduate Libraries, 11(2), 65-84.

Undergraduate Catalog 2005-2007. (2005). La Crosse, WI: University of Wisconsin-La Crosse.

Yiping, L., Abrami, P.C., and d'Apollonia, S. (2001). Small Group and Individual Learning with Technology: A Meta-Analysis. Review of Educational Research 71(3): 449-522.

APPENDIX

Handout
This is the handout used on February 8, 2006, the date of the lesson study.

Observation protocol, observer note form, and observer reaction form
Observation protocol and forms used by observers to record student observation data.

Completed observer notes and reactions
Completed observer notes from 4 observers of the Feb 8, 2006 session. One observer also completed the Reactions form.

Blank student evaluation form
This is the evaluation form used for all information literacy instruction sessions. Students are asked to complete this web-based form at the conclusion of the instruction session.

Compiled student evaluation data
Student evaluation of the Feb. 8, 2006 lesson.