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A library instruction case study: measuring success from multiple perspectives

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Abstract

Measuring the effectiveness of library instruction poses many challenges, yet is essential to validating the time and energy dedicated to it. Over two years, how subject specific library instruction addressed the needs of the students, the instructor and the librarians was studied. Students were surveyed; librarians analyzed their research paper bibliographies and interviewed the instructor. Using the concept of success provided a meaningful way to assess effectiveness. The study found that instructor and student indicators of success were well met while the librarian's success was less clear. Doing this study confirmed the belief that the one-shot workshop is only part of a holistic and continuous library instruction program.

1. Introduction

Library instruction is time and labor intensive, especially for new courses, and libraries must ask if the time and effort expended is justified. Does library instruction affect the students' information use? Does it expose them to information sources in the library they might not have used otherwise? Equally important, does collaboration with the instructor affect how the instructor presents the library to the students?

For several years, the subject librarian for Oregon State University's Fisheries and Wildlife Department has collaborated with a classroom instructor to integrate library research

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instruction into a required course in that department. The collaboration was prompted by the instructor's concern that students were getting so bogged down finding information for their major research project that they were not spending adequate time analyzing what they found and synthesizing it into a meaningful paper. The project is an environmental history on a place of personal interest, and the information the students need is not simple to identify and collect. The challenge for the librarian is to acknowledge the project's complexity while assuring students the assignment is doable. Over time, the instructor and the librarian have developed what should be a successful library experience:

- A strong collaborative relationship between the instructor and the librarian, based on complementary expertise;
- An instructor who believes students need to know the "stories" others have told in order to tell their own;
- A librarian knowledgeable in the interdisciplinary literature of the subject and oriented toward student learning;
- Classroom and library Web pages to enhance the instruction and provide time-of-need review;
- An assignment in which students have a personal connection to a topic that is rich with research possibilities;
- A well-timed library workshop with plenty of hands-on time.

So was the library experience successful? To find out, we surveyed the students about their research process, examined their bibliographies, and interviewed the instructor. When we put it all together, we concluded that "success" is not easily defined or determined. Success means different things to different players. The librarians want the students to explore the breadth and depth of available resources, and perhaps even catch a bit of our passion for doing library research. To the instructor, success means the students synthesize accurate information to tell a story of their own. For the students, success means getting a good grade and, to many, having an opportunity to learn more about a place that is special to them.

2. Background

Multicultural Perspectives on Natural Resources is a 200/300 level course in the Department of Fisheries and Wildlife. The content is interdisciplinary and the assignments demanding. The instructor expects the students to understand the interplay between the land and the people who have lived on it. For the major course assignment, the students write a five- to seven-page environmental and cultural history of a place with which they have a personal connection. They must research its biology, wildlife, geology and climate, its history and human inhabitants, and its conflicts. After submitting their topic, students work for five weeks on a first draft that the instructor grades by the same criteria she uses for the final paper. Marginal comments and an attached grading sheet indicate what students need to do if

they want to improve their grade. Students who are satisfied with this first grade do not need to resubmit the paper, but most work another three weeks on a final paper.

The library instruction consists of two primary components: a customized Web page prepared by the Fisheries and Wildlife (FW) subject librarian that is linked from the instructor's course page, and an optional workshop. After initial attempts at classroom lectures, the librarian and the instructor now divide the class (60–80 students) and offer two hour-long, hands-on workshops in the library three to four weeks into the quarter. One is scheduled during the regular class period and the other immediately after. Students are strongly encouraged to attend one of the workshops but are not required to do so. In the first half of the workshop, the librarian models the assignment using the library catalog to identify books and the Web to locate other information, paying particular attention to evaluating Web sites. Specific government sites are recommended and demonstrated for data on climate and geographic location. The librarian mentions local newspapers, historical societies, chambers of commerce, and ranger stations as sources for very specific information, potential interviewing opportunities, and difficult-to-local details. In the second half of the workshop, the students have the opportunity to begin researching their topic, with help from two librarians, the instructor, and a graduate research assistant.

The librarian also prepares a Web page for the class that reiterates the information given in the workshop and identifies specific resources (Webster, 2002). Included on the page are tips on searching and evaluating information as well as specific recommendations to a wide variety of resources, including an online forestry atlas (Oregon Department of Forestry, 2002), government services such as the Oregon Climate Center (Oregon Climate Service, 2003) and the United States Geological Service's state minerals site (USGS, 2003), and the University of Washington's *American Indians of the Pacific Northwest Digital Collection* (University of Washington Libraries, 2000). A brief handout directs students to the Web page, the library catalog, and recommended geographic and climate Web sites; it also includes information on evaluating and citing sources. The librarian's Web page is linked on the instructor's course page, and because students access all their course materials through this course page, the FW library research page is visible and readily accessible. In addition, the instructor refers students to it and to the FW librarian throughout the duration of the project. Thus, students who do not attend the workshop are provided with resources to help them complete the assignment.

3. Methodology

To determine whether the library experience was successful, we collected the students' bibliographies and asked them to complete a survey at the end of the term. We also interviewed the instructor about the project and the students. We worked with two sets of students in consecutive years. In winter 2000 (W2000), we analyzed forty-five bibliographies and brief surveys. The next year, winter 2001 (W2001), there were sixty-three bibliographies and expanded surveys (see Appendix A).

In W2000, we tallied the number of citations by type and format. In W2001, we also included the date of publication or access and assigned each bibliography a rating of inadequate, adequate, and outstanding. For the rating, our general criteria were type and appropriateness of sources and their currency when that was a relevant factor. We made note of those students who appeared to delve more deeply into their topic, using sources that provided new perspectives on the topic. In rating the bibliographies, we found specific criteria less useful than our professional judgment, a conclusion also arrived at by David Kohl and Betsy Wilson (1986) in their analysis of papers in beginning writing classes. We graded the bibliographies independently and then compared our results. We rarely disagreed (fewer than 10 of the 63 bibliographies) and when we did, defaulted to the FW librarian's assessment since she is more familiar with the assignment and the information sources.

The W2000 survey was brief and asked students about their class standing, major, attendance at the library workshop, and whether they had done research in the OSU Library prior to this assignment. As we looked at these surveys and the W2000 bibliographies, we realized we had an incomplete picture of students' research processes. Bibliographies tell us what students use, but not how they got there. How did they find that book? Did they use the catalog? Did they use indexes? Did they ask for help? Finally, we wanted to know how they felt about the research process, anticipating that the personal nature of the topic would make it more enjoyable. Thus, in W2001, we greatly expanded the survey to ask students about their use of specific library resources, time spent doing the research, degree of difficulty finding sources, and whether they enjoyed doing the research.

In W2000, 55 percent (45 of 82) of the students participated in the study; in W2001, 86 percent participated (63 of 73), due largely to the instructor providing additional credit for participation. Over the two years, the librarians and the instructor communicated on the practical aspects of the study and met to discuss expectations and impressions of what worked and what did not. This dialogue helped inform our approach to measuring success and crystallized the differences in our expectations. The following discussion explores the results of our survey and citation analysis primarily using the data from W2001. The W2000 data are discussed, but as our methodology differed from one year to the next, direct comparison is inappropriate.

4. Success: the students' perspective

The most obvious measure of success for students is the grade they receive. Other measures are the time and effort they feel they had to devote to the project and whether or not they enjoyed researching the topic. In all respects, the FW 240 research project was a success from the students' perspective.

In W2000, thirty were upper division students, thirteen were sophomores, only one freshman and one not reporting. Of the sixty-three students who participated in this study in W2001, thirty-nine were upper division (17 juniors and 22 seniors), twenty were sophomores, and four were freshmen. The students tend to be juniors or seniors fulfilling a core course requirement. We assume that most of these students should be familiar with campus

resources including the library, experienced with balancing course loads, and knowledgeable about doing library research at a basic level; seniors, on the whole, do better than sophomores but are quite similar to juniors. The number of freshmen is small, but they appear to struggle with both the information gathering and synthesis. Indeed, one freshman commented on the survey that being new at this, his/her ability to find and use resources was limited. Most students are in the sciences, and, according to the instructor, are not used to taking a class where there is not a "right answer." In this class, they must track lectures and readings, and eventually synthesize ideas and facts into personal observations and opinions. Even so, all W2001 students were successful in getting a passing grade from the instructor (Table 1).

Project grades were not made available in W2000. In W2001, students received high grades for the project. Forty of the sixty-three students received an A or A−, and none received a grade lower than a B. The instructor does not see this as grade inflation, but rather reflects that the students meet the challenge she extends to them in this project. She expects them to stretch their thinking, work beyond their familiar range of information, and incorporate different perspectives on issues. She was extremely pleased with the projects and the grades reflect her impression of the students' engagement with the course material and successful synthesis of the concepts. Grades for the course are distributed on more of a curve, suggesting that students connect with this component of the course at a high level. We do not attempt to claim a direct relationship between the project grade and library instruction since many other tangible and intangible aspects contribute to a project grade. However, the instructor believes there is a relationship.

Another student measure of success is the cost (the amount of time and degree of difficulty they face) versus the benefit (a passing grade). Certainly, time is a major factor in their lives and they are pragmatic in the decisions they make about how they spend it (Valentine, 1999, 2001). Again, students in our study were successful, with over half finding the project very or somewhat easy, and 43 percent spending about the time expected (Table 2). Most also found it at least somewhat enjoyable (Table 2).

Interestingly, more students with higher project grades found the project very difficult, which may suggest a willingness to invest themselves in the project. Most students, regardless of their grade, do not report having great difficulties with the library research.

Most seemed to find that the project took the amount of time they expected (43%) or less time (13%). So again, from the students' perspective, this endeavor was successful as it

Table 1
W2001 project grades by class standing

	Total	Freshmen	Sophomore	Junior	Senior
Total of students participating	63 (100%)	4 (6%)	20 (32%)	17 (27%)	22 (35%)
Project Grade					
A	30 (48%)	0 (0%)	6 (30%)	11 (65%)	13 (59%)
A−	10 (16%)	0 (0%)	5 (25%)	2 (12%)	3 (14%)
B+	19 (30%)	3 (75%)	9 (45%)	3 (17%)	4 (18%)
B	4 (6%)	1 (25%)	0 (0%)	1 (6%)	2 (9%)

Table 2
Finding information, doing research, and completing research by project grade

	All students (N = 63)		Project grade A or A − (N = 40)		Project grade B+ or B (N = 23)	
Finding information						
Very easy	6	10%	4	10%	2	9%
Somewhat easy	28	44%	18	45%	10	43%
Somewhat difficult	24	38%	14	35%	10	43%
Very difficult	5	8%	4	10%	1	5%
Doing research						
Enjoyable	17	27%	8	20%	9	39%
Somewhat enjoyable	37	59%	28	70%	9	39%
Not too enjoyable	9	14%	4	10%	5	22%
Completing research						
Less time than expected	8	13%	3	8%	5	22%
About time expected	27	43%	18	45%	9	39%
More time than expected	28	44%	19	48%	9	39%

worked into their hectic schedules. Perhaps, as the instructor hopes, students are spending more time synthesizing the information they find rather than looking for more information sources. They stop when they think they have enough to complete the project (Connors, 1990; D'Esposito & Gardner, 1999).

In her studies of undergraduate students' research behaviors, Barbara Valentine (2001) found that "motivation to devote more effort to an assignment might also be determined by personal factors," including the degree to which the assignment "inspired" them (p. 109). We found this to be true. Students, for the most part, like this assignment as it engages them and allows them to research a place of personal interest. The comment of one student reflects several we received on the survey: "I really liked the idea of this assignment because it allows you to study an area that is important to you. Writing about a place that means a lot to me makes it easier to spend the time working on it." The assignment also validates students' personal knowledge; both the instructor and the librarian reinforce the value of their local knowledge and access to unique resources.

5. Success: the instructor's perspective

Success from the instructor's perspective is reflected in the project grades (Table 1). Most students do very well in her opinion. They accomplish her three expectations: (1) to identify physical, biological, and cultural information on a special place; (2) to use the information to discuss the place's value and uses over time; and (3) to explore the conflicts and changes with an eye towards the future. She explicitly requires students to use multiple types of resources, including scholarly sources, popular press and government reports, Web pages, and personal contacts. Her grading criteria specify that the narrative must be "supported appropriately with

Table 3
W2000 and W2001 number of references used

	W2000	W2001
Number of students participating	45	63
Number of references	331	516
Mean # of references	7.44	8.19
Median # of references	7	7
Maximum # of references cited	15	26
Minimum # of reference cited	3	3

specific references'' and that citations are to be complete and conform to information distributed by the instructor and the librarian.

The instructor specifies a minimum of three citations (each a different type of resource) and anticipates more than the minimum. Using two years of data, we found that the students used an adequate number of resources (seven to eight on average) by the instructor's standard (Table 3).

Students are using a range of resources and include the instructor's essential components (biological, physical, and cultural information), as well as specific geographic and climate data (Table 4). This appears to be consistent over the two years surveyed.

The most heavily cited resource in 2000 was books, followed by government documents, and then Web sites. In 2001, Web use overtook use of books with government documents third. The actual number of Web sites would have been higher if we had not placed sources into other categories that described their origin rather than their format. For example, we explicitly counted a government document as a government document no matter the format. Both the instructor and the librarians expected students to use a large number of government documents, both electronic and print, since they are a rich source of information for

Table 4
W2000 and W2001 reference by type

	W2000		W2001	
Web sites	72	22%	172	33%
Books	125	38%	154	30%
Government documents	80	24%	79	15%
Images/maps	0	0%	26	5%
Interviews	17	5%	24	5%
Journal articles	9	3%	21	4%
Newspapers	11	3%	13	3%
Ephemera	6	2%	11	2%
Theses	4	1%	7	1%
Encyclopedias	0	0%	6	1%
Magazines	7	2%	2	0%
Archives/letters	0	0%	1	0%
Total	331	100%	516	100%
Climate data	18	40%	50	79%
Geographic data	15	33%	53	84%

Table 5
Citations by format for W2000 and W2001

	W2000		W2001	
Electronic	129	39%	253	49%
Print	185	56%	239	46%
Interviews	17	5%	24	5%
Total	331	100%	516	100%

the topics and were recommended specifically for climate and geographic data. In addition, many of the places students wrote about are national or state parks with informative, easily located Web sites.

The instructor and the librarians anticipated the upward trend in the use of electronic resources that is reflected in Table 5. The instructor has long accepted Web sites as legitimate information sources. She is concerned with the students' ability to evaluate them, however, so this was emphasized in the 2001 workshop. When reviewing the bibliographies, both the librarians and the instructor checked all Web sites and found very few that did not have some merit.

The instructor and the librarian encourage students to start with what they know and use personal histories, photographs, and interviews as sources. This explains the number of interviews cited. Because no students in W2000 cited the sources of images and maps they used, the instructor and the librarian emphasized the importance of doing this the following year. Armed with the knowledge that this was necessary and faced with the potential for loss of credit for inadequate documentation, these sources were cited more consistently in 2001. The same is true with sources for climate data.

As we noted earlier, the instructor believes the library instruction contributes to students' success with this assignment. The assistance and support they are given allows them to devote more time to synthesizing the information and writing the paper. The emphasis on evaluating sources has resulted in improved quality of Web sources cited. While grading the W2001 papers, she called to tell us of the "significant improvement in use of web sites . . . some are quite amazing" (J. Li, personal communication, March 2001). In a later conversation with her about the 2002 instruction session, she noted the "richer use of resources" in the W2001 papers (J. Li, personal communication, January 21, 2002).

6. Success: the librarian's perspective

During the library workshop, the librarian describes her expectations and reiterates those of the instructor. They differ, but are complementary. The librarian expects students to explore the information landscape, evaluate the resources found, use the "good" ones, document what is used, and enjoy the process. The instruction is geared towards completing a particular assignment rather then acquiring specific skills or competencies. We take the holistic view that instruction includes the librarian's Web page, the instructor's ongoing reference to the library and the librarian, and the help provided by library staff. Even so, we are interested in

determining the effect that attending the optional workshop had on students' use of the library, the quality of their bibliographies, their project grades, and the ease with which they found information.

Using the W2001 survey data, we observed overall usage patterns and then the relationship between workshop attendance and those patterns. We examined whether workshop attendance affected the bibliography rating and the students' perception of the research process. We considered looking at the effect on the project grade, but found that the high numbers of A's and A − 's negated any meaningful relationship; the probability of students doing well on the project was so high that the workshop or library effect was difficult to assess. As such, we measured our success by the bibliography ratings.

In the winter 2001 survey, we asked students to tell us what resources and tools they used to find what they cited (Table 6). They used the Internet extensively. This is not news to anyone who works with students at a reference desk or in the classroom. In this study, only one student did not use the Internet, though five students cited no Web resources in their bibliographies. Of the sixty-two students who did use the Web, most used a search engine to locate information. Half (50%) found sites by typing in the URL of a known site, and nearly half (44%) report using a directory or index to selected Web sites. Students who attended the workshop follow these same patterns. Those who did not attend the workshop report lower use of a search engine and direct typing of URLs and less use of Web directories, which makes one wonder how they are finding information on the Web. The workshop and the librarians' Web page provide the URL for recommended Web sites and students could connect directly from the page to the site. No directories of Web sites were specifically recommended however. Our observations of students' use of the Web indicate they use search engines almost exclusively, so this is an area that deserves further research. In our study, although we gave examples of directories of Web sites, we cannot be sure students understand what they are. Even so, it appears that those attending the workshop use more approaches to searching the Web.

Students also used the library, the staff, and the library catalog. This reinforces what we found in the bibliographies as many items cited in the bibliographies could be traced to the

Table 6
W2001 students' usage patterns and workshop attendance

	All students (N = 63)		Attended workshop (N = 41)		Did not attend workshop (N = 22)	
Used OSU libraries	58	92%	39	95%	19	86%
Used library catalog	56	97%	39	95%	17	77%
Used indexes and articles databases	30	52%	23	56%	7	32%
Asked library staff	26	40%	19	46%	7	32%
Asked a friend or classmate	16	28%	13	32%	3	14%
Browsed library shelves	38	66%	29	71%	9	41%
Used the Internet	62	97%	41	100%	21	95%
Used a Web search engine	57	92%	39	95%	18	82%
Typed in a URL	31	50%	22	54%	9	41%
Used a Web index or directory	27	44%	20	49%	7	32%

library collection. For example, the library's catalog includes numerous government documents, primarily in print with a growing number linked to electronic form.

Ninety-two percent of the students stated they used the OSU Library, a lower percentage than those who reported using the catalog, which strongly suggests that students associate "using the library" with being in the physical facility. This is reinforced by the number of students (67%) who found information by browsing library shelves. We have much anecdotal evidence—and our own research practices—to support the serendipitous discovery of information. The FW librarian encourages students to look in a variety of subject areas for this project, so browsing is a potentially effective method of finding resources in this course.

Over half the students reported using indexes (i.e., article databases), which is surprising because the assignment does not lend itself to research in journals or magazines nor did the library instruction stress periodicals as an important resource for this paper. Although the students say they used indexes, this was not a particularly productive path as only 7 percent of the sources cited in the bibliographies were newspapers, magazines, and journals.

Several factors could explain the high reported use of an index/database and the low number of periodicals cited. Students will return to familiar sources (Valentine, 1993), and the most heavily used database at OSU, *EBSCO Academic Search Elite*, is not a good source of information on the topics these students were researching. It could also reflect misunderstanding of the terms "index" and "database." An additional factor may be faulty recollection by the students since there was up to two months between when they could have started their research and when they took the survey.

Despite frequent encouragement to contact the FW librarian or the library's reference staff for help, fewer than 40 percent asked any library staff for help. The survey did not differentiate among type of library staff, and given the use of the student assistants at the library's service desks, "staff" here must be understood include these students. All people staffing public service desks were notified of the assignment and had easy access to the FW 240 Web page to help with questions. Of those students who did ask for help, 60 percent found library staff "very helpful."

Overall use of the library and its resources was quite high. Did attendance at the workshop increase that usage? Yes. A higher percentage of students who attended the workshop used the OSU Library, the catalog, and the indexes (Table 6). They were also more likely to ask for help from library staff and browse the shelves. We cannot prove a causal relationship between workshop attendance and use of the library; students who attend an optional workshop may be more motivated in general and more willing to put additional time and effort into their coursework as a whole. Still, these results suggest that the workshop makes a difference in students' use of library resources.

We are also interested in whether use of the library and workshop attendance affected the quality of their bibliographies (Table 7). When reviewing the bibliographies, we looked for citation style, inclusion of required pieces of information (e.g., climate and geographic), and diversity of references. We also looked for quality of sources, and whether or not students appeared to delve more deeply into their topic. Sixty-two percent of those using the library produced adequate or outstanding bibliographies compared with

Table 7
W2001 students' bibliography ratings and use of library resources

	General	Used library		Used library staff		Attended workshop	
		Yes	No	Yes	No	Yes	No
All students	63 (100%)	58 (92%)	5 (8%)	25 (40%)	38 (60%)	40 (63%)	23 (37%)
Bibliography rating							
Outstanding	13 (20%)	11 (19%)	2 (40%)	8 (32%)	5 (13%)	10 (25%)	3 (13%)
Adequate	25 (40%)	25 (43%)	0 (0%)	8 (32%)	17 (45%)	16 (40%)	9 (39%)
Inadequate	25 (40%)	22 (38%)	3 (60%)	9 (36%)	16 (42%)	14 (35%)	11 (48%)

forty percent of nonusers. Those who asked library staff for help received more of the outstanding bibliography ratings. Students who attended the workshop were more likely to have an outstanding bibliography and were less likely to have an inadequate one. Forty-eight percent of those who did not attend the workshop produced bibliographies that we found inadequate.

For the most part, those attending found the workshop somewhat helpful (Table 8). Those with the best and the worst bibliographies indicated getting more out of it, which is curious and suggests several possibilities. We could assume that those students with the least developed skills were bound to learn something while those with better information-seeking skills may have attended because they are dutiful students and perhaps picked up one or two tips. Alternatively, the students may have enjoyed the workshop even if it did not affect their success. They also could have been polite on their survey responses, not being confident in how the information would be used. It seems then that "helpfulness" is not a productive measure of instructional effectiveness.

In terms of students' perception of the research process, there are few differences between those students who attended the workshop and those who did not (Table 9). Most students in both groups found finding information either somewhat easy or somewhat difficult, doing the research somewhat enjoyable, and completing the research taking about as much time as expected or more time than expected. A higher percentage of those who did not attend the workshop thought it was easier to find information, enjoyed doing the research, and found it took less time than expected. Along the same lines, a higher percentage of those who attended the workshop found it difficult to find information, enjoyed the research less, and thought it took more time than expected.

Table 8
W2001 helpfulness of the library workshop

	Very helpful	Somewhat helpful	Not too helpful	Not at all helpful
All students, $N = 40$	5 (13%)	26 (65%)	6 (15%)	3 (7%)
Bibliography rating				
Outstanding	2 (40%)	6 (23%)	1 (17%)	1 (33%)
Adequate	2 (40%)	9 (35%)	4 (66%)	1 (33%)
Inadequate	1 (20%)	11 (42%)	1 (17%)	1 (33%)

Table 9
W2001 students' research process

	All students (*N* = 63)		Attended workshop (*N* = 41)		Did not attend workshop (*N* = 22)	
Finding information						
Very easy	6	10%	1	2%	5	23%
Somewhat easy	28	44%	19	46%	9	41%
Somewhat difficult	24	38%	16	39%	8	36%
Very difficult	5	8%	5	12%	0	0%
Doing research						
Enjoyable	17	27%	7	17%	10	45%
Somewhat enjoyable	37	59%	27	66%	10	45%
Not too enjoyable	9	14%	7	17%	2	9%
Not at all enjoyable	0	0%	0	0%	0	0%
Completing research						
Less time than expected	8	13%	3	7%	5	23%
About time expected	27	43%	18	44%	9	41%
More time than expected	28	44%	20	49%	8	36%

This is discouraging at first glance; how can we be successful if our instruction appears to confuse or discourage students? Information overload and the newness of doing research may be factors in these results. Several writers have noted that many students have a limited tolerance for information—too much overwhelms them (Bodi, 2002; Oberman, 1991; Valentine, 1999). In Valentine's (1999) study, students reported avoiding their instructors since these meetings "often left them more confused than before the contact, with the added burden of having to find more information" (p. 386). In our study, a student commented, "I found that I had collected too much information and it was hard to condense the information or know what was the most important."

Research, especially in new and unfamiliar topics, is complex and being introduced to new tools, with the expectation that they be used, may be a factor here as well. Even so, 78 percent of the students who attended the workshop reported that they found it very or somewhat helpful. Generally, student comments on the survey reiterated that most got something out of the workshop, and that library staff were helpful. Perhaps those students taking the library workshop recognized that doing research is complex, and at least one found it "comforting that the librarians were familiar with my project."

7. Successful library instruction

Measuring success of library instruction is complex. It is particularly challenging now as library instruction changes to incorporate the ubiquitous Web. Yet even as instruction changes, the perceptions of success from students, instructors, and librarians remain the same. In the course studied here, students want to get a good grade while exploring a topic of

personal interest. The instructor wants students to synthesize the information they gather into interesting, informative stories. The librarian expects the students to realize the full range of information available and use it well.

We can teach students to search the Web more effectively (e.g., which search engines work for what kinds of information), and we must teach them how to evaluate any kind of information they find. Although students report that they evaluate Web sources and appear to know the criteria they should use (Grimes & Boening, 2001; Tolar-Burton & Chadwick, 2000), studies have also demonstrated that the evaluation is ''superficial'' (Grimes & Boening, 2001, p. 20). Mary Ann Gillette's and Carol Videon's (1998) conclusion that 42 percent of citations in student composition papers were to other student papers clearly demonstrates the importance of teaching students to evaluate information. Rather than being unduly concerned about the trend towards use of Web resources for research, we should acknowledge that the Web, as well as the library's collection, provides students with useful information.

To increase the success of students, we also need to carefully examine if and how library instruction helps students use their time more efficiently and effectively to find good information. Time and accessibility of information are major factors influencing the breadth of information resources students explore (Lubans, 1998; Tolar-Burton & Chadwick, 2000). While librarians cannot create more time for students, we can continually evaluate the tools we provide and develop ones that help their research process. We can also assess the amount of new information introduced in an instruction section and be realistic about what can and cannot be learned effectively. In a study of undergraduate library use, Ethelene Whitmire (2001) verified what we assume: students like to browse. We should validate that this is another way to find information when used in conjunction with catalog searches, particularly when the catalogs do not include tables of contents or notes.

We also need to remember that students are not like librarians or their classroom instructors. As Sonia Bodi (2002) notes, ''scholars enjoy the process of researching a subject they love and have the maturity and experience to cope with ambiguity, dead-ends, and self-doubt inherent in research. Undergraduate students have few of these capacities'' (p.109). We must be honest about the complexity of researching a new and unfamiliar topic in new and unfamiliar territory and emphasize that help is available. Follow-up consultation or assistance by the librarian and the reference staff are critical components of instruction. The more that staff and student assistants at public service points know about class research projects and supporting Web pages, the better. Teaching for student success means extending instruction from the single workshop to when and where students need it—on the Web, at the Reference Desk, and at the 11th hour. Understanding students informs our teaching.

Improving success from the instructor's perspective requires communication and engagement. Clearly communicating expectations contributes to the success of a project from all perspectives (Davis, 2002, 2003). It also provides a foundation for the instructor/librarian dialogue. In this study, the instructor has taught the class for eight years, involving the librarian in the last six. The instructor feels the student projects have consistently improved, becoming richer and more complex. To her, this represents success. Students write more interesting and compelling ''stories'' about their special place. They seem to spend more time synthesizing the information they gather rather than stumbling over the gathering. In this, she

echoes Joseph Hinchliffe (2002) who, despite concluding that "vigorous intervention in the research process appears to do no harm even if appears to do no good," thought that "the term papers produced were improved by the guided research process . . . I felt that the best papers in the class were much better than usual" (p. 288). In the FW 240 class, the ongoing dialogue about teaching, the students, and the evolution of the course has engendered a commitment from the instructor to promote the library and its resources to her students and create assignments that expose students to new sources of information.

From the librarian's perspective, success remains inconclusive. The high use of the library suggests that the librarian and the instructor were successful in getting students to be aware of library resources and to at least attempt to use them. Even if they did not attend the workshop, they were exposed to the materials and processes through the Web pages and ongoing reminders from the instructor. Correlating workshop attendance and quality of the bibliographies suggests some positive affect, but is not overwhelming. The students' research process appears to have been complicated by the workshop. So, while we learned ways to improve our teaching, especially what we emphasize, and recognize the importance of both directing students to evaluate resources while validating their exploration, we cannot claim that class-specific instruction has a direct effect on the quality of student work.

8. Topics for further research

Studying a single course over two years reminds us that library instruction needs to be holistic and continuous. It is holistic in that only a small portion of students' learning takes place in the classroom. Too often the classroom teaching must focus on physical access (i.e., tools and processes) rather than intellectual access (i.e., defining and describing the information need, determining where the information is likely to be published, and evaluating it at all stages of the search). A library's systems, physical facilities, and staff are also an important part of students' library instruction. Library instruction needs to be continuous because we will need to teach as long as new students enter our schools and new patterns of information delivery emerge.

We believe that, while subject-specific one-shot workshops are helpful, something about them does not work well for students seeking information. To move us forward, we suggest four areas for further research: students' use of the Web, information overload, the relationship between instruction and public service desks, and finally, the impact of library instruction on faculty.

We confirmed that students will use multiple types of information and are willing to use multiple methods to access it; however, their preferred method is the Web. While there are many studies confirming this, we need to examine more closely how they search. In a recent class, we observed two students use Google™ to get to the library's catalog despite instruction on accessing it from the Library's Research Gateway. An Online Computer Library Center [OCLC] (2002) White Paper found that students are more likely to use Web portals like Yahoo or AOL to course-specific Web sites unless a link to the library page is

included on a classroom Web page. We point students toward Web sites we recommend in subject research guides or via selective gateways such as *Librarians Index to the Internet* and *Voice of the Shuttle*, but do they use them and, if so, under what circumstances?

Information overload is a problem for students and faculty. We found that students taking our workshop were more likely to be overwhelmed by the number of resources. Controlled experiments on the amount of information we present could help us determine what to teach in the classroom and how to build course or assignment specific Web pages to augment that instruction. Of course, it might not be a problem of too much information, but a lack of experience with sifting through the information. Research directly comparing teaching the tools versus teaching how to evaluate would be helpful.

We encourage students to ask for help, and a recent article by E. Stewart Saunders (2003) demonstrates that instruction increases students' use of the reference desk. What are libraries doing to assure effective follow-up at the reference desks? Do desk staff use Web pages created for specific classes and/or specific assignments? Are students getting the kind of help they were led to expect? Do students contact the librarian who taught the class?

Finally, our case study relied on a strong collaborative relationship between the instructor and the librarian. Integrating library instruction into the curricula may be easier if we can explain the impact and benefit of our work on faculty. Does library instruction improve their teaching, their research, and eventually their success? Research tends to survey faculty about their use of library instruction and their attitude toward it, as in a recent study by Rhonda Gonzales (2001). We could delve more deeply into how it changes their assignments, their presentation of the library and library research to their students, and their relationship with the librarian outside the context of instruction.

As librarians, we will continue to assess whether library instruction is worth the time and effort so we can justify the library's investment in teaching. Tallying the number of librarian/instructor contact hours tells us little. Rather than measure sessions and hours spent, we suggest looking at the concept of "success" from multiple perspectives as a gauge of the library's success. We should continue to look at how students perceive their research process and the value of the library as we try to help them exploit the information landscape. We should collaborate with instructors to raise student awareness of the value of the library's resources and services. We should encourage librarians and library administrators to understand that instruction is holistic, and that the time spent in the classroom is only one component. If students and instructors succeed at learning and teaching, the library succeeds.

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Appendix A. Information collected in study

	Information relevant to perceptions of success			Other information
	Student	Instructor	Librarian	
Survey Questions:				
Used OSU Library			X	
Used Oasis catalog			X	
Used Indexes/article databases			X	
Asked library staff for help			X	
Helpfulness of library staff			X	
Asked friend				X
Browsed shelves				X
Used internet				X
Used internet search engine				X
Used internet directory				X
Attended library workshop			X	
Helpfulness of workshop			X	
Ease of finding information	X			
Enjoyment of research	X		X	
Time spent doing research	X			
Citation Analysis:				
Total # of citations		X		
Types of sources cited		X	X	
Cited geographic source		X	X	
Cited climate source		X	X	
Cited recommended sources		X	X	
Appropriateness of source		X	X	
Date of source/date of access			X	
Librarian grade for bibliography			X	
Instructor Interview:				
Project grade	X	X	X	
Impressions of student engagement		X	X	
Quality of Web sources		X	X	

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