

Changing the Face of Instruction: Is Online or In-class More Effective?

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The Web-based tutorial is an attractive mode of delivery for information literacy instruction, but do we know that it is effective? A pre- and posttest study compared student learning from use of an online tutorial with learning from a traditional lecture/demonstration for basic information literacy instruction in freshman English composition classes. Measures of both student learning and student satisfaction were comparable for online tutorial and in-class instruction. The authors have implemented the tutorial for these classes and continue to improve it based on student and faculty feedback.



There is a long tradition of library instruction at the State University of New York (SUNY) at Oswego, and the instructional program is well developed. The library has concentrated its efforts on offering course-related instruction, with particular emphasis on freshmen students taking English 102: Composition II. During English 102 sessions, students are taught basic library research and information literacy skills. The authors focused on these classes for the purposes of this project.

Initially, the tutorial project was undertaken to employ new Internet technologies to decrease workload pressures felt by a reduced staff of instruction librarians. Another consideration was that the college's recently revised general education program requirements include an information and computer literacy component. This requirement and the burgeoning distance education program increased the need for such a tutorial. An online format for basic library

instruction also would allow librarians to focus on more specialized instruction in gateway courses (the introduction to a major) and upper-division capstone courses.

In the summer of 2000, as a team of three librarians, the authors began developing an online information literacy tutorial modeled on one created by Ulster Community College for use by all colleges within the SUNY system. Initially, the goal was to build a tutorial that would specifically address the objectives for library instruction for SUNY Oswego's English 102 classes (shown in the appendix), which are based on the Association of College and Research Libraries' *Information Literacy Competency Standards for Higher Education* (<http://www.ala.org/acrl/> under the link to "Standards & Guidelines"). In April of 2001, librarians met with English faculty teaching this course to review the first full draft of the tutorial and to solicit faculty input. During the rest of the spring and summer of

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that year, the authors developed the tutorial and made it ready for testing by fall. (See <http://www.oswego.edu/library/tutorial/index.html> for the current version of this tutorial.)

Using a tutorial, the authors could enhance instructional services, and testing of this tool would allow the authors to form a better picture of the effectiveness of the basic instruction program. A major goal of this study was to determine whether learning would be comparable using an online format versus traditional lecture/demonstration. Based on similar studies and informal observations, the authors predicted that the research would confirm the viability of moving to an online format for introductory information literacy instruction.

Literature Review

Since the introduction of the personal computer as a teaching tool, librarians have explored the use of computer-assisted instruction to teach information literacy skills. Over the past two decades, several significant studies have compared student learning resulting from computerized instruction with learning from traditional instruction. The authors' present interest is in empirical studies that target freshman college students and compare an online tutorial to in-class instruction for basic information literacy. Because the practice of instruction by online tutorials is still relatively new, few studies have been published on its effectiveness. In these studies, most researchers have found the differences between these two methods to be statistically insignificant, and as a result, librarians have tended to migrate to new technologies as primary means of delivery for introductory library instruction.

Early studies compared pre-Internet technology with traditional instruction. A 1980 study by Kathleen A. Johnson and Barbara S. Plake compared computer-assisted instruction (using the PLATO system) with library tours and in-person tutorial sessions for sixty-eight freshman English students at the University of Nebraska-Lincoln. Although this study demonstrated

better performance for both computer-assisted instruction and tutorial groups, cost considerations prevented implementation of these techniques for this pioneering program.¹ In 1994-1995, Joan Kaplowitz and Janice Contini compared computer-assisted instruction (hypercard) with lecture using a total of 423 beginning biology students at UCLA and found no significant differences in learning. Kaplowitz and Contini looked forward to an impending move to World Wide Web technologies that would address some of the problems reported in their study. For example, using hyperlinks, "students could interact with the material in any order they liked and could concentrate on just the material they felt they needed to review."² Another hypercard-based tutorial was tested by Patricia F. Vander Meer and Galen E. Rike in 1993, with ninety-eight freshman students at Western Michigan University completing the study. Improvement of mean scores from pretest to posttest showed no significant difference in student learning between the tutorial group and a group completing a traditional workbook assignment. Adoption of this tutorial as the standard meant tremendous time saving for reference staff, and plans were under way in 1996 to increase access by mounting the tutorial on the Web.³

With the integration of Internet technologies into library instruction, use of an online tutorial became a time- and cost-saving alternative that would deliver consistent content to large numbers of students. To assess the effectiveness of this new format in a first-year college program, Carol Anne Germain, Trudi E. Jacobson, and Sue A. Kaczor studied 303 students at University of Albany, SUNY. They compared their traditional lecture/hands-on approach with a Web-based interactive tutorial. Their study is similar to the study presented here in that it tested a freshman student population and used comparable instructional delivery modes. Germain, Jacobson, and Kaczor concluded that there was no difference in the effectiveness of these two types of instruction and that students did learn from instruction. This was based on a compari-

son of the mean scores by group, rather than by individual differences between pretest and posttest. No attitudinal issues were addressed. The potential concern that students would have no librarian interaction was resolved by having students continue with one of their two library sessions in a face-to-face class.⁴

A similar study by Lucy Holman (University of North Carolina) included 125 students in three groups: one taking an interactive tutorial, a second seeing a traditional demonstration of resources, and the control group having no instruction before testing. Based on mean pre- and posttest scores, researchers concluded that learning did take place in those groups receiving instruction and that posttest scores were similar for the tutorial and traditional groups. One observed weakness is a focus on comparing posttest scores, rather than analyzing differences between pre- and posttests across groups.⁵

Most recently, Marion Churkovich and Christine Oughtred at Deakin University Library in Australia compared learning for three methods of instructional delivery to 173 first-year students, with results that run counter to most previous studies. Analysis of mean scores indicated learning in all three groups. The traditional in-class group learned more than either the online tutorial group or the "mediated" group, who completed the tutorial with librarian assistance available. Despite this result, however, librarians have decided to continue with online instruction for basic classes, addressing design flaws in the tutorial and maintaining face-to-face instruction for advanced classes. Use of a commercially produced tutorial (although customized) and the small number and limited scope of knowledge-based questions in the test may have impacted this study.⁶

In addition to student learning, another factor of interest is student attitudes toward different formats of instruction. Some of the above studies assess levels of satisfaction through student surveys and informal interviews. Questions considered confidence levels after instruction, preference for the online format, organization of

content, and student perception of learning. Response to the tutorials was generally positive in these attitude assessments.⁷ A noteworthy result from Johnson and Plake was the preference among those in the computer group for the computer-assisted method, leading them to conclude that familiarity correlates with acceptance of this new technology.⁸ Only Churkovich and Oughtred found that confidence level was lower for the tutorial groups.⁹

A study by Stephanie Michel at Radford University looked exclusively at student and faculty response to online tutorial instruction, specifically an introduction to library research targeted at beginning English composition students. Although preference for the tutorial over traditional instruction was not as strong as predicted, 53 percent of students "would recommend to other students" and 50.4 percent "prefer to formal instruction session."¹⁰ Michel's study differs from others in that Radford's tutorial was an optional supplement to standard library instruction. The one section required to use the tutorial rated it more highly than did the overall test group. Faculty preferred traditional instruction three to one, but all felt they would recommend the tutorial to others.¹¹

Research Question

Although most studies have found learning to be comparable for online and traditional in-class instruction, results have been inconsistent and sample populations and research designs have varied. The authors felt that more evidence of the value of online instruction and a more robust study using matched scores was needed. And, in particular, the authors undertook this study to assess the value of the unique information literacy tutorial for the SUNY Oswego population of English 102 students. To begin, the authors formulated this research question: Will the Web-based information literacy tutorial be as effective as traditional instruction sessions?

To fully explore this, the following investigative questions and hypotheses were posed:

- Will students learn from information literacy instruction?

H1: Students will have higher scores in the posttest than in the pretest.

- Will students learn as much or more from the online tutorial as they do from traditional in-class instruction?

H2: Students in the experimental tutorial group will improve their scores as much as or more than the control in-class group.

- Will students be at least as satisfied with the Web-based tutorial as they are with in-class instruction?

H3: Students in the experimental group will report as much or more satisfaction with the learning experience than will students in the control group.

Methodology

This evaluation is based on a pre- and posttest of an experimental group and a control group. The target population consisted of students taking English 102: Composition II at SUNY Oswego. The authors recruited three instructors of English 102 who agreed to have their students participate in the study, for a total of six sections. All three instructors also required a library research assignment and agreed to distribute sections evenly between those taking the online tutorial and those receiving in-class instruction. By limiting the number of faculty involved, variation in research assignments and instruction provided by the English faculty was minimized.

The six sections provided 120 students as potential subjects for this study, with 64 students completing the entire procedure. Considering the experimental design, this was found to be an acceptable number. The design accommodates more controls than would be possible in a larger, more survey-oriented study and allows for the matching of pre- and posttest scores by individual. The number of subjects is consistent with previous studies¹² and is adequate for the t-test, which is designed for use with small samples.

A more important issue than the size of the sample is whether the sample represents the population. Selection of this kind does not provide a random sample,

so the results in isolation cannot be generalized beyond the English composition students at this college. This selection method gave about 13 percent of the target population (with about 480 composition students in the particular semester).

The independent variable for this study was the mode of instruction. The experimental group completed a Web-based tutorial. The students had no instructional contact with library faculty other than through the administration of the tests and an introduction to the mechanics of completing the tutorial. All other interactions with library faculty and staff were limited to standard reference and directional assistance. The control group received traditional in-person instruction, including a fifty-minute in-class lesson and an outside assignment of a brief worksheet. Library faculty followed a standard lecture/demonstration lesson plan. The control students were not referred to the tutorial by either their instructor, the library faculty, or the library staff.

The dependent variables were the responses that the students made to the pre- and posttest questions. These test items serve as the operational definitions of the learning outcomes and correspond directly to the learning outcomes or instructional objectives that guided the development of both modes of instruction. Learning was measured by matching pre- and posttest scores for individuals. A survey of satisfaction with the instruction was administered with the posttest only. (Samples of this test and survey may be obtained by emailing infolit@oswego.edu.)

The pretest was administered just prior to each instructional session. Each student received the same explanation, instructions, and motivational support for the test, and had one week to complete the worksheet or tutorial. In the second week after instruction, each student took the posttest.

Pre- and posttest questions were identical, but the students were not informed of that. All tests were administered in an online format, and the testing software shuffled the items so that each student received a slightly different test form. The

posttests were given outside class during specially scheduled times. Students were not graded by their faculty on test or worksheet performance.

Results

The data for this study include the scores on the pre- and posttest for each student and on each student's responses to the satisfaction survey. The sixty-four students produced an average score of 75.55 in the pretest and an average of 80.08 in the posttest (table 1). The positive difference of 4.53 points represents an average improvement of slightly less than one item out of the twenty on the tests. The average improvement of the online group was 3.75 points and the in-class group was 5.83 (table 2). The survey results are from Likert scale values ranging from one for "strongly disagree" to five for "strongly agree." The averages that range around four represent agreement with the positive statements in the survey (table 3). The average near three (preference for online instruction) indicates general neutrality. The following discussion presents the statistical analysis on each hypothesis.

T-test on the First Hypothesis

H1: Students will have higher scores in the posttest than in the pretest. The average difference in the scores will be greater than zero.

For this hypothesis, a two-tailed t-test with a 0.05 confidence level was used. With 63 degrees of freedom, the t value comes to 2.679 and $p = .009$ (figure 1). Because the value of p is less than .05, the positive mean difference of 4.53 is statis-

	Mean	Standard Deviation	Standard Error of the Mean
Pretest	75.55	11.095	1.387
Posttest	80.08	10.709	1.339
Difference from Pretest to Posttest	4.53	13.53	1.691

tically significant (greater than zero). This test supports the hypothesis and gives a positive answer to the first research question. These students did indeed learn from the instruction they received.

Figure 1 gives a clear graphic presentation of the improvement in scores between the tests. In the pretest, the scores are more broadly and evenly distributed and the peak is near the middle of the range. In the posttest, the scores are unevenly distributed and concentrated in a higher peak to the right side of the range. The lines in this figure are graphic approximations of the respective curves.

The idea that such a small average improvement is still significant and should be taken seriously derives in part from the wide range of individual differences in test performance. The average improvement of less than five points includes individual decreases in performance of up to thirty points, as well as individual increases of up to thirty-five points (figure 2). This range of performance pulls down the average effect, although 58 percent of the students showed improvement and twenty-nine students (45%) had an improvement of ten points or more.

T-test on the Second Hypothesis

H2: Students in the experimental tutorial group will improve their scores as much as or more than the control in-class group. There will be no difference between the groups in mean difference in scores, or any significant difference will be a greater improvement in the experimental group.

Instruction	N	Mean	Standard Deviation	Standard Error of the Mean
In-class	24	5.83	13.647	2.786
Online	40	3.75	13.576	2.146

TABLE 3
Statistics on Satisfaction Survey by
Mode of Instruction

Instruction	N	Mean	Standard Deviation	Standard Error of the Mean
Recommend				
In-class	24	3.92	.717	.146
Online	40	3.68	.829	.131
Learned				
In-class	24	4.25	.532	.109
Online	40	4.10	.955	.151
Confident				
In-class	24	3.96	.751	.153
Online	40	4.13	.686	.109
Prefer				
In-class	24	3.13	1.035	.211
Online	40	3.28	1.261	.199

This test used a one-tailed, matched *t*-test with a 0.05 confidence level. The change in scores is based on subtracting the pretest score from the posttest score for each student. The average improvement of the twenty-four in-class students was 5.83, and that of the forty online students was 3.75.

The *t*-test compares the average change of the in-class group with that of the online group, with a difference between the groups of 2.08. With 62 degrees of freedom, the *t* value comes to .593 and the one-tailed *p* = .278, which is much greater than .05. The difference between the groups is not statistically significant; therefore, the results of the *t*-test support the hypothesis. The in-class control group performed a little better, but the difference between the groups of slightly more than two points represents less than one half of one question out of twenty. The line graph in figure 2 illustrates how similar the two groups were in their performance. The statistical results on the second hypothesis indicate that online instruction is as effective as in-class instruction.

T-test on the Third Hypothesis

H3: Students in the experimental group will report as much or more satisfaction with the learning experience than will

students in the control group. There will be no difference between the groups in their mean rating of satisfaction, or any significant difference will be a higher satisfaction rating in the online group.

This test used a one-tailed *t*-test with a 0.05 confidence level. Table 4 reports the results. Each row is labeled with a keyword from the corresponding item on the survey. The values of *p* are all greater than .05; therefore, the differences between the groups (mean difference) on these measures are not statistically significant. This supports the hy-

pothesis that students will be at least as satisfied with the online tutorial as with in-class instruction. The graph in figure 3 illustrates the similar responses of both groups.

The written open-ended responses from the survey were compiled and informally analyzed by the investigators. The authors also observed behaviors of the students using the tutorial and collected verbal remarks from the students and English faculty who participated. In a review of these observations and comments, three main points emerged.

First, neither mode of instruction addresses all learning styles. Some students in both groups reported that they would have preferred the alternate type of instruction: "I think that I would have liked the instruction in-class [online student]"; and "I personally feel that I would have learned more if I had participated in the online instruction [in-class student]." Some students were aware of their own learning style, especially with regard to preference for reading as opposed to listening or vice versa: "I have a hard enough time reading books that are instructional in nature ... in my own case I am a better listener when it comes to learning. [online]"; and "I enjoyed this and learned a lot be-

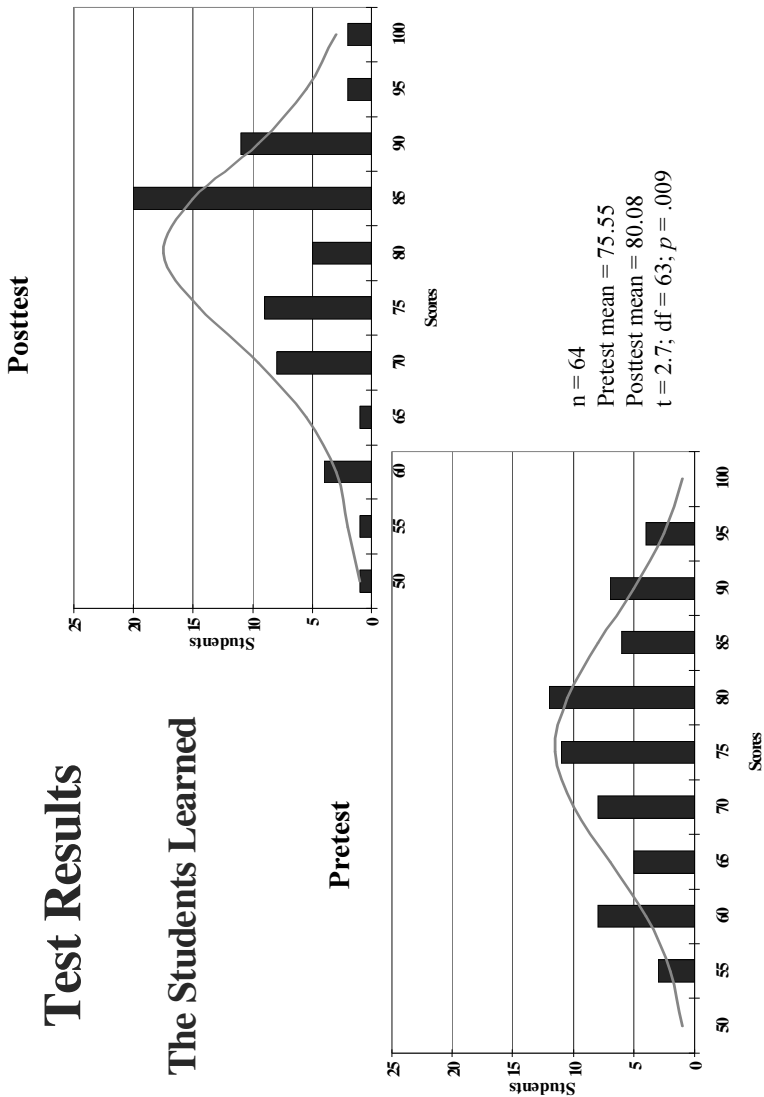
cause I actually had to read the information and process it [online]."

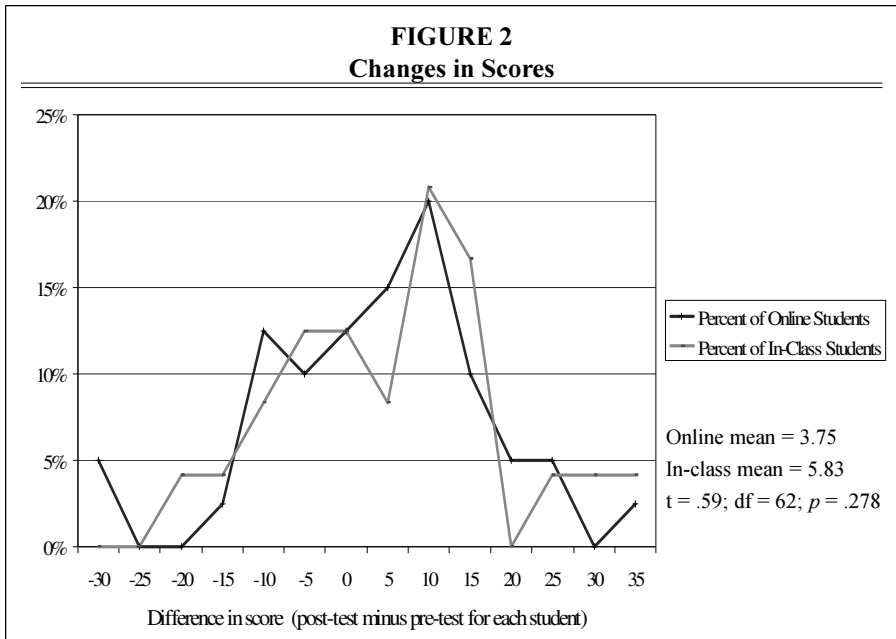
Second, the students were more interested in active participation than in reading lots of text or hearing a detailed lecture, especially when it came to using online systems: "I seem to learn more if I can actually perform the task as I am learning it [in-class]"; and "Have more 'practices' in the tutorial [online]." They liked the chance to do some of their own work while progressing through the tutorial: "I now know about

the online journals, and Infotrac has helped me greatly in my research [online]."

Finally, the students found the timing of library instruction important. Some students expressed a desire to have instruction available at the time of need: "I think that we should do this the first week of classes, not halfway through [online]." Other students liked having the material available for later reference: "Using online instruction I would be able to refer to it, whereas with in-class instruction a lot of

FIGURE 1
Test Results





material was given to me at once and easily forgotten [in-class].”

Discussion

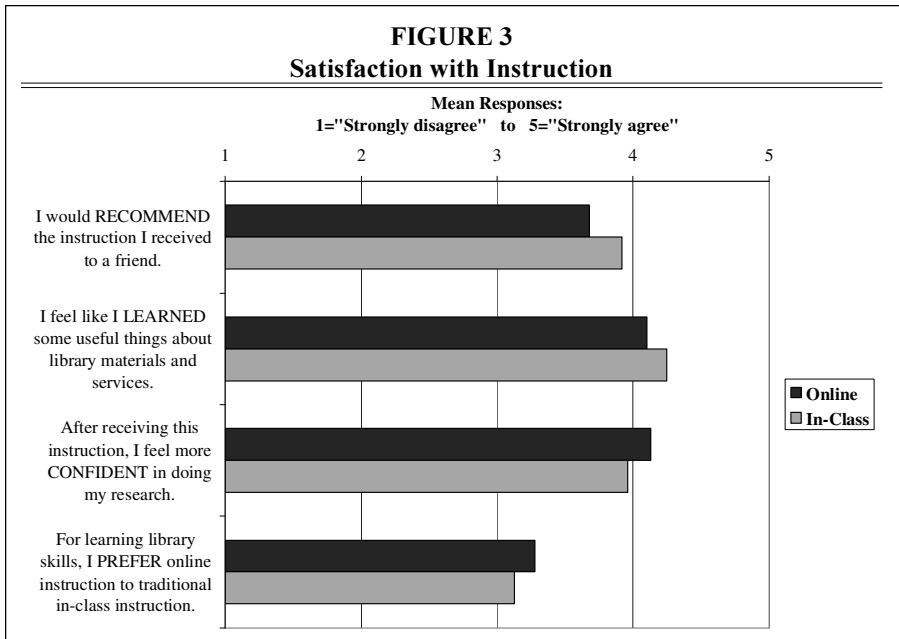
The results of this study confirmed the authors’ hypotheses that students learn as much from an online tutorial as from traditional in-class instruction and that they are satisfied with online instruction. With this assurance, the authors began implementing a plan for transition of English 102 library instruction to the online tutorial.

Beginning in spring 2002, the authors encouraged English 102 faculty to use the tutorial for their library instruction. Although a number of English department faculty supported this change, some resis-

tance still exists to using the tutorial as the sole means of library instruction. Faculty concerns, which the authors share, include loss of contact with librarians, loss of contact with the physical and social space of the library, and inexperience of adjunct English faculty with changing library resources. After meeting with the English department, a resolution was reached: Classes would still come to the library for instruction, and librarians would provide a brief in-person introduction to the tutorial and remain in the classroom to answer questions as students complete the tutorial. The installation of a computer-equipped library classroom has helped facilitate this strategy. In the fall 2002 semester, ten of eighteen English 102 faculty requesting in-

TABLE 4
T-tests on Survey Results

Label	t	df	p (one-tailed)	Mean Difference	Standard Error Difference
Recommend	1.186	62	.120	.24	.204
Learned	.806	62	.212	.15	.186
Confident	-.908	62	.184	-.17	.184
Prefer	-.492	62	.313	-.15	.305



struction agreed to use the tutorial. For all librarians, use of the tutorial eliminates preparation time, and for some it reduces the number of in-class sessions.

Supplementing the tutorial are assessment tools that may be requested by the teaching faculty. Following the study, a traditional in-class worksheet was adapted for use with the tutorial, and students are encouraged—and sometimes required—to complete it. This has been used with varying degrees of success because students are often driven by the worksheet questions, skipping significant portions of tutorial content in the process. By observing classes and grading the worksheets, the authors can see that the worksheet is relevant and engaging for students. The authors continue to refine it to more fully incorporate the desired learning outcomes and to encourage higher-order thinking skills. Improvements include adding questions to address more of the objectives and inserting directions to students to complete corresponding tutorial sections first. An online multiple-choice test (this study's pretest/posttest) is another assessment option, but it has not been popular among librarians or English faculty.

In addition to implementation with English 102 classes, the authors have received very positive response to this tutorial throughout the library and across campus. Its Web availability at all times, from on or off campus, has made this resource especially popular with SUNY Oswego's growing population of distance learners and their faculty. Librarians have found it a good point of departure at the reference desk for on-demand introduction of students to many basic library skills and procedures. Further, they have found it useful as a baseline for subject-specialized instruction, assigning it in advance or for remediation. Moreover, the tutorial is valuable for transfer students new to local library resources and non-traditional students unfamiliar with the electronic environment of today's library.

Implications for Future Work

This project has raised a number of issues, including the need for tutorial modifications. Maintenance of the tutorial is very time-consuming for the library's instruction team because library services are constantly changing. Considering the results of this study, the authors agree with

Germain, Jacobson, and Kaczor's conclusion that "this is time well spent."¹³ As reflected in student comments, the authors also need to redesign tutorial components to better accommodate different learning styles. This presents a unique challenge for online instruction because of its one primary mode of delivery.

To continue the evaluation of the tutorial, the authors plan to analyze student performance on individual test questions to weed out or change those that are poorly constructed. This improved test can be used to identify strengths and weaknesses within the tutorial. In addition to the test, the tutorial evaluation will include usability studies, student feedback surveys, and reviews of completed worksheets. A follow-up senior-year study with the same students is planned to assess long-term retention of basic library skills and development of advanced information literacy abilities.

At the campus level, making the tutorial a requirement for all English 102 classes is a goal of the library instruction

team. This is especially important in consideration of general education requirements, including basic information management skills and expository writing, and of ACRL information literacy standards. Sharing data from this study with college faculty will demonstrate to them that students using the tutorial are learning, and this should strengthen faculty support for continued collaboration in English 102. The need for documenting and assessing information literacy outcomes collegewide makes use of the tutorial and its assessment tools of interest to administration.

This action research project allowed the authors to evaluate student learning in a way that was practical, used a mix of evaluation methods, and was scientifically sound. It had an impact on decision making and has led Penfield Library into a process of continuous learner-centered improvement of its instruction program and other services. The study also begins the library's contribution to SUNY Oswego's developing assessment effort.

Notes

1. Kathleen A. Johnson and Barbara S. Plake, "Evaluation of PLATO Library Instructional Lessons: Another View," *Journal of Academic Librarianship* 6, no. 3 (July 1980): 154–58.
2. Joan Kaplowitz and Janice Contini, "Computer-assisted Instruction: Is It an Option for Bibliographic Instruction in Large Undergraduate Survey Classes?" *College & Research Libraries* 59, no. 1 (Jan. 1998): 19–27.
3. Patricia F. Vander Meer and Galen E. Rike, "Multimedia: Meeting the Demand for User Education with a Self-instructional Tutorial," *Research Strategies* 14, no. 3 (summer 1996): 145–58.
4. Carol Anne Germain, Trudi E. Jacobson, and Sue A. Kaczor, "A Comparison of the Effectiveness of Presentation Formats for Instruction: Teaching First-year Students," *College & Research Libraries* 61, no. 1 (Jan. 2000): 65–72.
5. Lucy Holman, "A Comparison of Computer-assisted Instruction and Classroom Bibliographic Instruction," *Reference & User Services Quarterly* 40, no. 1 (fall 2000): 53–60.
6. Marion Churkovich and Christine Oughtred, "Can an Online Tutorial Pass the Test for Library Instruction? An Evaluation and Comparison of Library Skills Instruction Methods for First-year Students at Deakin University," *Australian Academic & Research Libraries* [online] 33, no. 1 (Mar. 2002) [cited 25 Nov. 2002]. Available from Gale Group, InfoTrac OneFile, Farmington Hills, Mich.
7. Kaplowitz and Contini, "Computer-assisted Instruction"; Holman, "A Comparison of Computer-assisted Instruction and Classroom Bibliographic Instruction"; Johnson and Plake, "Evaluation of PLATO Library Instructional Lessons"; Vander Meer and Rike, "Multimedia."
8. Johnson and Plake, "Evaluation of PLATO Library Instructional Lessons," 156–57.
9. Churkovich and Oughtred, "Can an Online Tutorial Pass the Test for Library Instructions?" ¶ 28.
10. Stephanie Michel, "What Do They Really Think? Assessing Student and Faculty Perspectives of a Web-based Tutorial to Library Research," *College & Research Libraries* 62, no. 4 (July 2001): 317–32.
11. *Ibid.*, 324.
12. Johnson and Plake, "Evaluation of PLATO Library Instructional Lessons"; Vander Meer and Rike, "Multimedia"; Holman, "A Comparison of Computer-assisted Instruction and Classroom Bibliographic Instruction."
13. Germain, Jacobson, and Kaczor, "A Comparison of the Effectiveness of Presentation Formats for Instruction," 71.

Appendix: Objectives for Basic Information Literacy Instruction For English 102 and other new students

The goal for the basic information literacy instruction module is: The students will learn information literacy skills, enabling them to move from awareness of information needs, through the process of information retrieval, to effective and ethical use of this information.

The italicized text below is taken from the Associate of College and Research Libraries' *Information Literacy Competency Standards for Higher Education*. The boldface text is our local statement of objectives.

Standard One: The information-literate student determines the nature and extent of the information needed.

A student who completes basic information literacy instruction will be able to:

- Select a research topic and explore it using overview and background sources, and become familiar with important terminology
- Identify areas where more information is needed or desired

Refining a topic and thesis is incorporated into the host course.

Standard Two: The information-literate student accesses needed information effectively and efficiently.

A student will be able to:

- Select appropriate systems in which to search for sources, including the library catalog, periodical indexes and databases, reference bibliographies, and Internet resources
- Demonstrate use of search statements using keywords, Boolean AND operator, controlled vocabulary subject headings, and other appropriate limits
- Identify the format and location of a source using a bibliographic citation, and understand how to retrieve the source from the library shelf, an online database, or through Interlibrary Loan

Standard Three: The information-literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.

A student will be able to:

- Evaluate sources using the following criteria: authority, appropriateness, timeliness, and usefulness/relevance
- Keep records of sources used for later reference and for citation

Interpretation of and learning from sources is incorporated into the host course.

Standard Four: The information-literate student, individually or as a member of a group, uses information effectively to accomplish a specific purpose.

This standard is incorporated into the host course.

Standard Five: The information-literate student understands many of the economic, legal, and social issues surrounding the use of information, and accesses and uses information ethically and legally.

A student will be able to:

- Demonstrate awareness of correct reference and citation format
- Demonstrate awareness of copyright issues
- Demonstrate awareness of Penfield Library services and resources
- Demonstrate awareness of how to access library services and resources online and in-house
- Demonstrate awareness of the value and responsible use of shared library resources and services

The standards are available in: ACRL, *Information Literacy Competency Standards for Higher Education*. 2000. Online at <http://www.ala.org/acrl/> under the link to "Standards & Guidelines."