Assessing the Information Literacy of Undergraduates: Reports from the UCLA Library’s Information Competencies Survey Project

Patti Schifter Caravello, Judith Herschman, and Eleanor Mitchell

Introduction

The Information Need

Librarians have long had anecdotal evidence that undergraduates do not possess adequate information skills for some of the course work they are required to do, let alone for lifelong learning. At UCLA, with a vigorous but decentralized approach to library instruction, it has been hard to see the way clear to establishing or implementing basic information literacy goals for undergraduates. Convinced that hard data would help move this forward, and hoping to gain a better understanding of information competence at UCLA, the Instructional Services Advisory Committee embarked on an assessment project supported by the library administration.

Literature Review

While there are many articles on information literacy, lists of competencies, and descriptions of information literacy programs and courses, there is a paucity of actual assessment tools that measure student competencies rather than evaluate library instruction. Tests of the pre-test/post-test variety exist for assessing the efficacy of particular library instruction sessions, but these are not suitable instruments for testing general information competence. User surveys rating satisfaction and describing library use do not provide an objective skill assessment piece. The frequency of requests for such instruments on the BI-Listserv, for example, is evidence that there is a need for the development of assessment tools. In a real way, the lack of an assessment tool became part of the problem we tackled.

While our study was completed before the publication of the ACRL Information Literacy Competency Standards for Higher Education, our own list of competencies derives from local thinking as well as the review of many of the articulations by colleagues in the profession. The competence lists in print and on academic library Web sites are too numerous to cite. It is, however, worth noting some of the Web sites from the California State University Libraries because

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of the enormous amount of information literacy work they have done here in California. Lorie Roth describes information competence assessment initiatives at several universities in California, including a study at California State University San Marcos to measure student attainment in information literacy over a four-year period. Susan Carol Curzon describes the California State University Information Competence Skills Assessment, a telephone survey in which 3,000 students responded to hypothetical research and information seeking scenarios. The results of this survey have not yet been published.

Other academic libraries have undertaken related assessments and have developed their own instruments which were of interest to us. An effort to compare student self-assessment of information skills with objective evaluation was described by Greer, Weston and Alm. Two surveys at Johns Hopkins University compared freshmen and upper-classmen at that institution, focusing first on evaluating basic library skills and then adding some advanced skills. Indiana University Bloomington Libraries Assessment Plan for Information Literacy while not offering a single assessment tool, describes a plan for assessing information literacy and articulates, for each information literacy goal, specific objectives and possible measurement techniques. Kent State librarians reported on a pretest used to assess basic library skills primarily of freshmen enrolled in an English II course. The Teaching Library at University of California, Berkeley, first surveyed graduating seniors in the Political Science and Sociology departments in March-May 1994, and has repeated the survey with students in these and other disciplines. Pat Maughan is completing an article summarizing the results.

**Objectives of the Study**

1. To gain an understanding of information competencies of undergraduates at UCLA.
2. To improve the effectiveness of library instruction at UCLA by making recommendations to Public Services Council based on analysis of the data.
3. To provide UCLA librarians data they can use in discussions with faculty about library instruction and students’ information literacy.

We hoped that the results would jumpstart discussions on campus information literacy goals. After realizing that the information literacy literature contained so little on assessment of competence, we also determined with this study to contribute something to the understanding of information literacy assessment.

**What was Tested**

Our overall goal was to assess whether exposure to the library – over the course of four years of college, through the requirements of one’s major, through library instruction, or simply via a higher rate of library use – has any impact at all on student information competence. We thus explored several indicators of exposure. Specifically, we hypothesized that:

(a) The higher the class level, the higher will be the students’ scores on the Information Competencies Survey.
(b) Students in disciplines that require independent library research will score higher than students in disciplines which do not.
(c) Students who visit the library frequently (at least once a week) to use its resources will score higher than students who do not visit the library frequently.
(d) The more library instruction students have had, the higher they will score.

We did not venture hypotheses on particular competencies (e.g., whether students were competent at online searching with Boolean operators, or whether they know when it is appropriate to make a footnote, etc.). Of course, in the process we did indeed obtain information on the particular competencies, and these are reported in section IV.F.

The committee defined information competencies which all UCLA graduating seniors should possess. The numbered items on this list are the competencies. The lettered items are the specific behaviors and skills which a student needs to employ effectively in order to achieve the competence.

Information competence of undergraduate students at UCLA is defined by the ability to:

1) Define the research topic and the information need
   a) state a research question, problem, or issue
   b) understand the need to identify and define relevant terminology and keywords, and the concept of controlled vocabulary
   c) understand what types of materials exist (including books, journals, Internet, government documents, fieldwork, datasets, media, primary vs. secondary sources, popular vs. scholarly, etc.) and which are needed for the research
   d) determine who would be the producers and providers of the information required for the research
   e) understand the limitations of information availability

2) Develop and implement an effective search strategy/process appropriate for an information need
   a) understand what types of reference sources exist (specialized encyclopedias, indexes, abstracts, databases, bib-
Assessing the Information Literacy of Undergraduates

Design of the Study
The Sample
Our goal was to administer the questionnaire to 500 undergraduate students and we nearly reached it with 453. The Registrar’s sample was randomized by systematic sampling so every undergraduate had an equal chance of being picked. The response rate (calculated as the number of students who took the test divided by the number who received the email) was 14.3%. We assume the number of students who actually opened the email or opened it in time for one of the test dates was lower than the number who received the email. A lower number in the denominator would have yielded a higher response rate, but we had no way of knowing how many opened the email and we cannot possibly speculate. How to increase response rate remains elusive.

The data about our sample in table 1 are derived from the demographic portion of the instrument. The data about UCLA undergraduates as a whole are derived from the UCLA Campus Profile for 2000,12 which gives data for 1999. With the low response rate we had, it would be impossible to say our sample was representative of the whole UCLA undergraduate population even though the sampling technique was randomized. Still, the percentages for sex and major are fairly similar.

Test Administration
Before administering the test, we received an “Exemption from Human Subject Protection Committee Review” through the UCLA Office for Protection of Research Subjects. This process is required of all campus research projects using human subjects.

Participation was solicited via email sent in May, 1999 by the registrar to a systematic sample of 3,500 students (actually 3,180 when the “undeliverables” were subtracted). Students were offered a $10 incentive to spend 10–20 minutes to complete a questionnaire that would “help improve library services.” They had a choice of dates, and came to take the test on a drop-in basis in centrally located, non-library buildings. Student IDs were checked against the list of those who received the email, and each student was given a $10 bill upon returning the completed questionnaire.

The committee spent a good deal of time deciding how best to administer the instrument. We weighed the advantages, disadvantages, and expense of multiple mailings of the instrument with and without telephone follow-up. We considered the privacy issues related to posting it on the Internet, but concluded that the benefits outweighed the disadvantages. Participation was solicited via email sent in May, 1999 by the registrar to a systematic sample of 3,500 students (actually 3,180 when the “undeliverables” were subtracted). Students were offered a $10 incentive to spend 10–20 minutes to complete a questionnaire that would “help improve library services.” They had a choice of dates, and came to take the test on a drop-in basis in centrally located, non-library buildings. Student IDs were checked against the list of those who received the email, and each student was given a $10 bill upon returning the completed questionnaire.

Table 1: Characteristics of the Sample and of UCLA Undergraduates as a Whole

<table>
<thead>
<tr>
<th>Category</th>
<th>Sample</th>
<th>UCLA Undergraduates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>61%</td>
<td>55%</td>
</tr>
<tr>
<td>Male</td>
<td>39%</td>
<td>45%</td>
</tr>
<tr>
<td><strong>GPA</strong></td>
<td>3.1</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freshman</td>
<td>28%</td>
<td>15%</td>
</tr>
<tr>
<td>Sophomore</td>
<td>24%</td>
<td>20%</td>
</tr>
<tr>
<td>Junior</td>
<td>18%</td>
<td>29%</td>
</tr>
<tr>
<td>Senior</td>
<td>30%</td>
<td>37%</td>
</tr>
<tr>
<td><strong>Major</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Sciences</td>
<td>36%</td>
<td>28%</td>
</tr>
<tr>
<td>Sciences</td>
<td>34%</td>
<td>41%</td>
</tr>
<tr>
<td>Humanities</td>
<td>8%</td>
<td>10%</td>
</tr>
<tr>
<td>Arts</td>
<td>4%</td>
<td>3%</td>
</tr>
<tr>
<td>Unknown or Undeclared</td>
<td>18%</td>
<td>16%</td>
</tr>
</tbody>
</table>
Web or sending it via email, and finally we had to face certain facts. It is not an interesting or enjoyable test to take, it lacks humor and solicits no personal opinions on topics of concern to students. Regardless of how we administered it, without an incentive (and even with one) we were concerned we could not obtain a decent size sample. Some of us also felt that having the students take the test in a classroom setting, where there was no possibility of consulting others or the computer to answer the questions, would be a better test of what they knew at that moment in time.

**Budget**

The Library administration supported the project; specifically, the AULs for Public Services and for Human Resources allocated the funds to complete it. The amount of money spent was $9,566.00, itemized below. This represents cash outlays and in no way accounts for the amount of person-hours spent over the three-year period.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data analysis by the Institute of Social Science Research (ISSR)</td>
<td>$3,861</td>
</tr>
<tr>
<td>Room rental</td>
<td>840</td>
</tr>
<tr>
<td>Photocopies</td>
<td>335</td>
</tr>
<tr>
<td>Incentives</td>
<td>4,530</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$9,566</strong></td>
</tr>
</tbody>
</table>

**The Survey Instrument**

**Description**

The 25-item, self-administered questionnaire consists of:

- 11 demographic questions designed primarily to ascertain students' class level and major, the amount of prior library instruction students received, and the amount and extent to which the students use library (including online) resources
- 14 questions (47 variables) designed to test one or more of the information competencies listed above

The instrument and our evaluation of it can be viewed on the Web at <http://www.bol.ucla.edu/~jherschm/survey.pdf>

The instrument does not test the effectiveness of particular library instruction sessions or whole programs. Nor is it a survey of opinion. It is a test to discover how skillful or knowledgeable students are generally with library resources, online searching, and information seeking concepts. For this study, the test was administered on paper in a non-library classroom setting.

**The Process of Creating the Instrument**

Focusing on the competencies and our knowledge of undergraduate information needs and behaviors, the committee created and revised the test questions. We keyed every question to one or more of the competencies on the list. We then shared a draft of the instrument and the competencies list with other librarians in our units, asking them to key the questions to the competencies if they could. The idea was to see if their matches and ours would be the same. From this valuable exercise we gained some good suggestions, further revised some questions, and changed some of the question-competence matches we had made. We also gained a better sense of both the content validity and face validity of the instrument. The process of front-line librarians creating an instrument and additional librarians with fresh eyes providing feedback on how well the questions tested the competencies seemed to be the best method at our disposal. The only published survey we referred to in any significant way during this process was from Johns Hopkins (1993).

**Vetting the Instrument**

We tested the survey on a group of nine students who work in the Library's Access Services Department. Later we ran a more ambitious pilot test of the revised instrument with a convenience sample of three large lecture classes. Students were asked, but not required, to complete the test on their own time, and no incentive was offered. While we did not score these tests, we did a question-by-question analysis of all 127 completed samples to determine which questions might be problematic. We revised and reformatted the instrument accordingly.

Finally, well after the May 1999 study was completed, we sent the instrument by email to students in the UCLA library school, asking only second year students to participate. We received 16 completed samples. The goal was not to improve the instrument, which had already been used to test undergraduates, but rather to compare the average scores of the undergraduates with those of a group of "expert" subjects, i.e., students who we would expect to do well. The mean score of the library students (86.8%) was significantly higher than the mean score of the undergraduates tested (61.7%). This increased our confidence in the study and provided us with a basis for comparison with which to characterize the undergraduate scores and answers.

**Summary of Major Findings**

**Library use**

Through analysis of variance it was possible to compare
the mean score of students who had a high rate of library use (N=188) with the mean score of students who had a low rate of library use (N=226). The average score of the high library use students (64.2%) was higher than the average score of the low library use students (59.7%), and the difference is statistically significant, that is, it was not due to chance. Nor was it due to other factors (class or major). Since these scores appear fairly close, however, it is not certain that the difference indicates something meaningful.

It is interesting to look at some of the specific findings within the library use data. A slightly greater difference in scores than the overall one was seen between the high and low users of ORION, Melvyl, and journals and books. This is shown in table 2.

### Class
Using analysis of variance and t-tests we found that the average score of seniors (66%) was statistically significantly higher than the mean scores of any of the other classes (see table 3). This finding was not due to chance or other factors (major or library use). There was no significant difference between the mean scores of freshmen, sophomores, or juniors. Comparisons were made class by class as well as between each class and everyone else. Although seniors scored higher, for the group tested there was no trend indicating the higher the class level the higher the score. From this data we cannot tell whether the statistically significant six percentage point difference between seniors and the others is substantive.

### Major
There were 33 majors represented by the 373 students who reported majors (80 reported no major or “undeclared”). The 33 majors were recoded into four main groups because there were too few students in each major to make comparisons meaningful. It can be seen in table 4 that the students in the sample were not evenly distributed between the four groups, but they roughly corresponded to undergraduates in general at UCLA. Students whose major fell in the area of the humanities scored statistically significantly higher on the test (with a mean of 66.3%) than students in the social sciences (62%), arts (63.9%), and sciences (60.2%). This finding was not due to chance and was independent of other factors (class, library use).

However, again, the differences are not great enough to conclude there is a substantive significance to the finding. From the data we cannot necessarily tell whether our hypothesis that “students in disciplines that require independent library research will score higher than students in disciplines which do not” is valid. While humanities students may well do more independent library research than science students, we do not know if the differences here are due to this, nor are the differences great.

### Library instruction
The students who reported having had a high quantity of library instruction or tours anytime from high school through college did not score significantly higher on the test. However, almost two thirds of the 52 students in the “high” group had their library instruction or tours in high school, where most of the skills and concepts tested by our instrument would not likely have been covered. The number of students in the “high” group who had their library instruc-
tion in college was so small (N = 19, or 4.2% of the sample) that it is impossible to say that this result indicates anything meaningful in our academic setting. Table 5 shows how many and what percentage of students fell into the “high” library instruction group.

The miniscule number of students who had had more than 5 instruction sessions or tours at UCLA (N = 3) is a reflection of the fact that library instruction at UCLA is not systematically infused into the curriculum. Were library instruction integrated broadly into UCLA courses and objectives for majors, it is likely more students would have been in the “high” library instruction group, and we might have learned more. As it is, the small numbers here do not give us the information we would need to understand the relationship of library instruction to information competence. Under “Further Research” below, we include a suggestion on this.

Question clusters

We grouped the test questions into five clusters corresponding to the five main information competencies. The data was analyzed to see how many students got all the questions correct in a single cluster in order to find out what percentage of students were knowledgeable enough to answer correctly all questions about a set of skills as opposed to individual skills. Hardly any students succeeded in doing this. The fifth competence (“Organize and synthesize”) was covered with only one test question, so the cluster approach was not meaningful for that competence. The highest number of students getting all correct in any of the first four clusters indicates sporadic knowledge in our sample rather than competence. This conclusion is supported by the generally low scores.

The data on the question clusters is in Table 6.

### Findings from individual questions

1. **Online catalog & Boolean strategies.** Only 18% of the sample did not know how to proceed if their online search result was too big; 82% knew to add search terms and try again. Yet 45.5% did not know that in a Boolean statement, OR retrieves more records than AND or NOT. While 68% knew to change their search terms if they retrieved zero results on “French revolution,” one-third of the sample did not know what to do in that case. These mixed results reflect competencies 2c and 3a.

2. **Critical thinking.** About half (52%) of the sample said they would check a statistic from a newspaper in a government source before using it in a term paper, meaning the other half would just use the unverified data or check it in the prior year’s newspaper. More intriguing: although 84% of the students thought the date and author of the Web site would help them evaluate the authority and accuracy of the information provided on the site and about half thought the Web address (including “arco.com”) would help them evaluate it, two thirds (66%) did not include the link to “What ARCO does” as an element that would help evaluate the site’s authority and accuracy. Most of the students correctly did not check off the parts of the Web site which would not help in this regard (variables 71, 72, 74, and 75). Yet 67% said that the Web site created by ARCO would be valuable as an objective source on which to base their paper on air pollution in Los Angeles. If the student was unaware of what ARCO is, the “don’t know” option would make sense, but only 5% chose this option. Only 28% correctly said it would not be a valuable resource for this purpose. (Among the library school students, 75% said it would not be a valuable resource.) Oddly enough, although 15% said they did not know which elements of the Web site would help them

### Table 5: Students in the “High” Library Instruction Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole course (v11)</td>
<td>14</td>
<td>3.1%</td>
</tr>
<tr>
<td>Over 5 at UCLA (v12)</td>
<td>3</td>
<td>0.7%</td>
</tr>
<tr>
<td>Over 5 at another college (v13)</td>
<td>2</td>
<td>0.4%</td>
</tr>
<tr>
<td>Over 5 in High School (v14)</td>
<td>33</td>
<td>7.3%</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>11.5%</td>
</tr>
</tbody>
</table>

### Table 6: Question Clusters

<table>
<thead>
<tr>
<th>Competence</th>
<th>Test questions in cluster</th>
<th>Variable numbers</th>
<th>% of students answering all questions in cluster correctly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define the topic</td>
<td>1, 5, 8, 12</td>
<td>v31, v49, v56, v66</td>
<td>1.3%</td>
</tr>
<tr>
<td>Develop a search strategy</td>
<td>2, 3, 10</td>
<td>v32, v33-38, v58</td>
<td>1.8%</td>
</tr>
<tr>
<td>Locate &amp; retrieve information</td>
<td>4, 6, 9, 11</td>
<td>v39-47, v50, v57, v5-65</td>
<td>0.4%</td>
</tr>
<tr>
<td>Evaluate information &amp; strategy</td>
<td>13, 14</td>
<td>v67-75, v77</td>
<td>1.5%</td>
</tr>
<tr>
<td>Organize &amp; synthesize</td>
<td>7</td>
<td>v51-54</td>
<td>35.8%</td>
</tr>
</tbody>
</table>
evaluate its authority and accuracy, only 5% said they did not know if the site would be valuable.

3. Citation. About 62% of the sample could not identify a correct and complete journal article citation for a bibliography. Although the “wrong” choices given were not extremely wrong, they did lack the entire article’s page numbers and they included extraneous information. Moreover, the correct answer was not dependent on knowing a particular style of citation. A similar number, about 60%, did not identify as a journal article one of the article citations in the question 11 reference grid, and 40% could not identify the other one. Between 55-58% thought the three book citations were journal articles or other forms or checked “don’t know.” Contrast this with the 97% who correctly identified the Web site.

In addition to the ability to decipher bibliographic references (competence 3b) is the intellectual processes of citation (competence 5b). In question 7, three instances are given all of which would require a footnote in a research paper. Ten percent of the students either checked “don’t know” or said none of these instances required footnotes. Slightly over one-third of the students would not include a footnote if they copied a whole paragraph in their paper. And 56% would not include a footnote in a research paper if they read an article and wrote it over their own words. But 76% knew that if they quoted a sentence from the article they should include a footnote.

4. Call number. Although only 11% of the sample checked “don’t know” on what information can be discerned from a call number in question 4, it is clear many more did not know. About one quarter of the students said the publication date could not be determined (although the example included one), and about the same percentage said the number of pages can be determined. About a quarter said the owning library can be discerned from the call number, and a slightly smaller percentage said the location of the item cannot be determined from the call number. For each of the variables just mentioned (publication date, number of pages, owning library, location) about three-quarters of the sample knew what was discernable from the call number. Still, 60% did not think they could tell which cataloging system the library uses by looking at the call number. And fully 72% did not indicate that the subject can be discerned from the call number. Compare this last figure with the library school students, all but one of whom knew the subject can be discerned. The results here (competence 3d) speak to familiarity with and understanding of a very basic aspect of libraries which most of us take for granted that all undergraduates already know.

5. Choosing the “best” resource. Fully 78% of the sample said that searching the Web would be the best way to identify current and authoritative information for a research paper on the Y2K problem; only 15.5% would use a periodical index. Two thirds (67%) of the students could not identify the primary source on the list in question 8. To find the borders of the former Yugoslavia, 38.6% would correctly use the Encyclopedia Americana, but 35% would use the Atlas of American History or the Encyclopedia of Associations. The average percent correct for all the variables in question 3, where students had to choose the best source for each topic, was 61.4%. (The library school students’ average for these variables was 90.7% correct.) Once again, the undergraduates were aware of some good strategies and resources, but many of the results are disappointing.

Conclusions and Recommendations

Conclusions

As with much research, answers lead to more questions. The randomly selected group of undergraduate students tested did not display a high level of information competence as measured by the instrument. The average score of 61.7% is quite low relative to the average score (86.8%) of the group of library school students. The statistically significant differences noted for seniors, humanities majors, and students who use library resources frequently are intriguing. If there is no gradual rise in scores for the four classes, why did the seniors score highest? What is it about majoring in the humanities that led to higher scores? The data do not answer these questions. We can guess why the high library-use group did better: more experience with the online systems, more trial and error, more exposure to information seeking problems and solutions may lead to somewhat more knowledge. “Statistical significance, however, need not have anything to do with substantive interpretations of the factors, since a statistically significant factor may not always be identified correctly in terms of empirical phenomena.”

It should be stated again that the differences between the groups, although not due to chance alone (by definition of “statistically significant”) were not large enough to be greatly impressive. The difference between 66% and 60% is small when you consider that the higher score means an average of 31 correct out of 47 variables, while the lower score means 28 correct out of 47 variables. We cannot necessarily say that our study’s statistically significant findings “reveal something meaningful about the object of study,” i.e. are substantively significant. Yet, they do bear out to varying extents three of our four hypotheses which
The statistically significant findings are based on average scores of groups we defined by class, library use, major, and past library instruction in order to test our hypotheses. The 453 students’ individual scores ranged much more widely than the average scores of the groups studied (from 27% to 89%), but our data analyses do not explain the differences between the highest and lowest scores. Might there have been other ways to define groups? Perhaps by grade point average, ethnic or language factors, gender, even personality characteristics related to information seeking or education? As these are factors we as librarians cannot affect, we did not look at them. They nevertheless might be something to investigate in order to understand information competence better.

A close look at the findings from the clusters, the individual questions, and the overall scores leads to the conclusion that while students are not at a total loss when it comes to the concepts and skills tested, at best they possess sporadic knowledge. The librarians on the committee had considered the test an easy one from the outset. Had we included more difficult questions and simply a higher number of questions testing each competence in more depth, we speculate the scores would have been even lower.

With respect to the finding related to library instruction, it is significant that library instruction at UCLA is decentralized and so not, in an overall way, geared toward an established set of information literacy objectives nor characterized by systematic curricular tie-in. Individual sessions certainly incorporate objectives and curricular relevance, but there is no progressive, formal instruction sustained through the four years or as part of the major, nor has library instruction overtly been considered (by academic departments or university administration) an integral part of a UCLA education. Given that, and despite our hypothesis that the “high” library instruction group would do better, it is not wholly surprising that they did not. If this group had been larger, would the result have been the same? We do not know. Nonetheless, a new hypothesis arises from this finding: that undergraduates whose colleges require or incorporate systematic, curriculum-integrated information literacy education, with all the goals, ways and means in place, will be more information competent than students in schools which lack such a focus. It is possible that what makes the difference is not just the number of library instruction sessions a student has had, but whether they are part of an integrative program.

The instrument was necessarily neutral in terms of academic discipline; yet assessment, like information literacy education, might best be accomplished in the context of particular disciplines, “as information literacy manifests itself in the specific understanding of the knowledge creation, scholarly activity, and publication processes found in those disciplines.” We do not know if the students would have done better if the questions had related solely to their major subjects. We assume that the basic or general competence we sought to assess would still be important in order to do well on a more subject-oriented test.

**Recommendations**

Our recommendations to the library administration were based on a careful review of question responses, the scores and other data from the questionnaires, and our combined librarian experience. Among the recommendations were that the library create a dialogue with the faculty about the survey results, the concepts of information literacy, and approaches to it. In doing so, we will focus on the finding that increased use of library resources relates positively to students’ general information competence. We hope the result is that faculty increase library and online resource-based assignments where students are required to find, use, and evaluate books and articles apart from the list of course readings. We also hope more faculty will use librarians to help raise the level of students’ information competence. Faculty may be unaware, for example, that librarians can teach Web evaluation skills that would counterbalance the prevalence of the Web and its uncritical use by students.

Other recommendations were ideas for making information literacy education more systematic at UCLA, beginning with adopting the ACRL standards.

**Further Research**

Some ideas for further research arose from our experience of conducting the study and using the instrument, others from analyzing the results.

1. Test incoming freshmen to identify areas of particular weakness so these can be addressed in library instructional programming or directly by faculty
2. Redesign the instrument with a particular subject discipline as a context for information competence, and use it to test students majoring in that discipline
3. In order to address hypothesis b (whether independent library research being more important in some majors affects information competence): Test students majoring in subjects at opposite ends of the “independent library re-
search" spectrum to compare the two groups.

4. Given the limitations of multiple choice tests and survey research, explore other methods of testing in order to get a better, more comprehensive impression of information competence and where the weaknesses and misunderstandings lie. Examples: live sessions where the tester watches the student search online, or open-ended questions where students have to come up with their own research strategies for given topics.

5. With the cooperation of faculty, conduct pre-tests and post-tests at the beginning and end of a quarter to compare scores of students who had a library assignment or research paper with those who had not. This could help our understanding of the effects of library use on information competence.

6. With focus groups and/or pre-tests and post-tests, determine which instructional methods, techniques, or programs are most effective in increasing information literacy.

In addition to the three librarians who wrote and presented this report, committee members included at various times Eloisa Gomez Borah, Susan Allen, and Kathy O'Boyle.

Notes


10. An earlier version of goal number 1 reflected our original desire to compare the competence of freshmen with that of seniors. We later changed the survey design for logistical reasons. Goal number 1 was altered to reflect that change by referring simply to "undergraduates."

11. Goal number 2, written at the project's outset, reflects our hope that the study would give us information that we could use to help us improve library instruction. In no way did we view the study or the instrument as capable of measuring the effectiveness of library instruction at UCLA.


13. The average GPA given for our sample is the average for the 439 students who supplied this information. A verage GPA for all UCLA undergraduates was not available.


15. High library use was defined as using specific library resources such as online catalogs ORION and Melvyl, reference books, journals, books, reserve lists, the Web, etc. four or more times since fall quarter, and visiting the library to use its resources at least once a week. The data came from variables 20–30 on the instrument.

16. A high quantity of library instruction was defined as having taken a whole course in library research methods and resources, or having had a library class or tour more than 5 times in high school or college.

17. A fair percentage of the students (27% for v71 and v74, 14% for v72, and 42% v75) thought that the links to the information offered by the site would help them in the task of evaluation. While it is understandable to want to see the information to be
to judge it, a more critical approach would lead to the conclusion that it hardly matters what the information is when the author cannot be seen as an objective or reliable source of information on the topic for a research paper.

