Good morning! Welcome to “Where Have You Been? Where Are You Going?: Assessing Student Information Skills”! My name is Diane Duesterhoeft and I currently serve as the Chair of the Information Competency Task Force at St. Mary’s University (StMU) in San Antonio, TX. I have been a reference and instruction librarian at StMU since 1993, and currently coordinate these areas.

A word about this presentation: There are quite a few data tables in this presentation. You have been warned!

I want to share what our university did to gain an initial assessment of our undergraduates’ information skills and to think about and discuss some of the implications.
Dedicated to
the memory of
Devin
Zimmerman
A little context about St. Mary’s University: We are a Catholic university founded by the Society of Mary or Marianists. Our library serves approximately 2700 undergraduates and 700 graduate students. Our campus also has a law library serving about 700 law students at the only ABA-accredited Law School in San Antonio. We are a Hispanic Serving Institution located on San Antonio’s West Side. Approximately 55% of our undergraduates are Hispanic and most of our students are from Texas or the Southwest.
St. Mary's University students who are information competent will have an understanding of how knowledge is organized and will be able to:

- determine what information is needed for a particular purpose, whether this be in connection with an academic, personal, or professional pursuit;
- access needed information effectively and efficiently;
- evaluate information and its sources for authenticity, relevance, and reliability;
- integrate new information with their existing knowledge;
- use information effectively to accomplish a specific purpose;
- and understand the ethical, economic, legal, and social issues surrounding the use of information.

Two years ago I participated in ACRL’s Institute for Information Literacy Immersion program. Shortly after that, we formed an Information Competency Task Force (ICTF). I should mention that we use IL, IC, and IF rather interchangeably. One of the ICTF’s first tasks was developing a mission statement, which you see here. It draws largely on the Information Literacy Competency Standards for Higher Education endorsed by the American Association for Higher Education, and the Council of Independent Colleges, as well as by ACRL.

We soon determined that we needed to assess our students’ information literacy skills to determine what areas specifically needed to be addressed in our developing information competency program.
Research Practices Survey

- Developed by the First-Year Information Literacy in the Liberal Arts Assessment project (FYILLAA) Collaboration
- Initial members included Carleton, Grinnell, Macalester, and St. Olaf Colleges; University of Chicago
- Expanded to more private colleges and universities
- RPS available for free download

We looked at what other institutions had done or were doing. We obtained information and costs about other instruments used for assessing information literacy, such as Project SAILS, Information Literacy Test developed by James Madison University, and the iSkills assessment developed by ETS. Others cost, and RPS seemed to measure what we desired. Spoke with colleagues who had used the other instruments, as well as RPS, and they were satisfied with RPS.

One difference however is that we felt it was important to not only assess our incoming freshmen, but to also assess our upperclass students, if possible, to get a picture of what was and wasn’t happening for our students in terms of information literacy. My rationale was that if we only assessed the incoming freshmen, our faculty could say, “well, of course, they aren’t information-competent. That’s what we develop with them in our courses.” The ICTF wanted to be able to show what was and wasn’t happening with our upperclass students. We felt this could help us pinpoint the areas of greatest need.
ND0101 is a “non-departmental” Personal & Academic Skills course that all incoming freshmen are required to take. It’s a course that orients students to various services of the campus, as well as covering skills such as money, time, and stress management and preparing students for other aspects of college life. The library has a module in this course, that provides students with an overview of the library’s collections and services and provides hands-on searching opportunities in using our catalog and one of our subscription databases. We were able to administer the RPS to all students who attended the library session of this course.

EN 3300 (Advanced Composition) is a core required course; variety of majors. We assessed 6 sections of this course. Rank breakdown among EN3300: 1 freshman, 14% sophomores, 46% juniors, 38% seniors.

Discuss schools and majors breakdown.
An identical percentage of new students and upperclass students reported that they had used their respective type of library—high school or college library—one or more times per week in the last academic year. More new students, 9%, indicated they had not used their high school library during the previous school year, than Advanced Composition students, 3%, indicated they had not used the college or university library during the prior school year.
Most Frequent Reason for Library Use in Prior School Year

- ND0101 students: Conducting research for school assignments or projects (49%)
- EN3300 students: Studying, doing homework, doing a group project (60%)
Teacher or librarian had talked to one or more of your classes about library resources, including Internet resources, during prior school year

- ND0101 students: 73%
- EN3300 students: 60%

Only 60% of upper class students had a teacher or librarian talk to one of their classes about these resources.
Five or more school projects had required 3 or more sources in a works cited list, during prior school year

- ND0101 students: 44%
- EN3300 students: 36%

Perhaps we are shortchanging our upperclass students by not requiring more research in their class projects?
During prior school year, for research used:

Print library books
- ND0101 students: 79%
- EN3300 students: 64%

Print academic or research journals
- ND0101 students: 40%
- EN3300 students: 56%

More new students used books for their projects than advanced students.
During prior school year, for research used:

Online journals, magazines, newspapers, or encyclopedias
- ND0101 students: 72%
- EN3300 students: 79%

Online library catalog
- ND0101 students: 36%
- EN3300 students: 51%

Online indexes or databases (such as EBSCO, Gale, JSTOR, ProQuest, InfoTrac, etc.)
- ND0101 students: 42%
- EN3300 students: 38%

Since more ND0101 students (79%) indicate they used print library books in their research than Advanced Composition students (64%), there must be other ways that these students are finding library books.

Since online databases have become a primary means of providing access to articles from journals, magazines, and newspapers in today’s academic library, it is more difficult to gain access to articles from library periodicals without using these databases.
Table 2. Prior Academic Year Research Consultation with People or Resources

<table>
<thead>
<tr>
<th></th>
<th>ND0101</th>
<th>EN3300</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Almost Always&quot; or &quot;Often&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers or professors</td>
<td>64%</td>
<td>45%</td>
</tr>
<tr>
<td>Librarians</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>Parents or other adult family members</td>
<td>24%</td>
<td>13%</td>
</tr>
<tr>
<td>Friends, classmates, or siblings</td>
<td>56%</td>
<td>32%</td>
</tr>
<tr>
<td>Writing labs, writing centers, or help groups</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>Help screens, online tutorials, or other electronic resources</td>
<td>14%</td>
<td>6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>&quot;Never/NA&quot;</th>
<th>ND0101</th>
<th>EN3300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Librarians</td>
<td>48%</td>
<td>60%</td>
</tr>
</tbody>
</table>

Individual humans are more likely to be consulted than non-human or group human resources among both groups (generally).

The ICTF found it interesting that students in both groups, and especially among the upperclass students are less likely to use online help screens or tutorials, despite being part of the Net Generation.

Among the individual human options, however, librarians are least likely to be consulted.
Which of the following best describes the way you pace your work on a research assignment?

*I do all of the work just before or on the due date.*

- ND0101 students: 7%
- EN3300 students: 14%

Twice as many upperclass students as new students admit to doing all the work on their assignment just before its due.
Students were asked about how challenging they found various components of research. Table 3 shows the percentage of students in each group who found each task “very easy” or “somewhat easy.”

Both groups find developing the main argument or thesis statement the most difficult component of research. While 71% of the ND0101 students found narrowing their topic easy, this percentage dropped to 53% among the Advanced Composition students. Perhaps the lower percentages among advanced students on some of the research processes reflects higher expectations and more difficult subjects involved in college work.

Slightly more upperclass students found documenting sources easy compared to the new students.
Table 4. Attitudes About Identifying and Retrieving Sources

<table>
<thead>
<tr>
<th>&quot;Very easy&quot; or &quot;Somewhat easy&quot;</th>
<th>ND0101</th>
<th>EN3300</th>
<th>&quot;No Experience&quot;</th>
<th>ND0101</th>
<th>EN3300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using a library catalog</td>
<td>65%</td>
<td>70%</td>
<td>12%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Using an electronic index (such as EBSCO, Gale, JSTOR, ProQuest, InfoTrac, etc.)</td>
<td>52%</td>
<td>48%</td>
<td>28%</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>Using a print index</td>
<td>48%</td>
<td>48%</td>
<td>28%</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>Using an Internet search engine</td>
<td>94%</td>
<td>96%</td>
<td>1%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Physically locating sources in a library</td>
<td>72%</td>
<td>70%</td>
<td>3%</td>
<td>3%</td>
<td></td>
</tr>
<tr>
<td>Obtaining materials through inter-library loan</td>
<td>18%</td>
<td>22%</td>
<td>58%</td>
<td>61%</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 indicates the percentage of students in each group who found each task “very easy” or “somewhat easy.” The percentages among both groups were very similar. Table 4 also shows the percentage of students in each group who had no experience with each of the activities. Again, the percentages were fairly similar among both groups.

The ICTF was surprised at the number of students who indicated they had used a print index, since many of us on the ICTF thought of this as a print periodical index, and we rarely see or assist users with using print periodical indices anymore. However, the students may have legitimately considered a print index a “print book index” which might account for the percentage who indicated ease of use with this tool.

The high percentage of advanced students with no experience in using InterLibrary Loan shows a potential need for more education about this service, but may also reflect the higher percentage of students who work on their research assignment just before or on the due date.
Table 5. Attitudes About Using Sources

<table>
<thead>
<tr>
<th>&quot;Very easy&quot; or &quot;Somewhat easy&quot;</th>
<th>ND0101</th>
<th>EN3300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determining whether a source is appropriate for an academic project</td>
<td>82%</td>
<td>78%</td>
</tr>
<tr>
<td>Deciding what information from your sources to integrate into your project</td>
<td>67%</td>
<td>72%</td>
</tr>
<tr>
<td>Knowing when to document a source</td>
<td>64%</td>
<td>65%</td>
</tr>
<tr>
<td>Knowing how to document a source</td>
<td>59%</td>
<td>64%</td>
</tr>
</tbody>
</table>

The students were asked how challenging they found using sources through several defined activities. Table 5 shows the percentage of each group who found the each activity “very easy” or “somewhat easy.”

A high percentage in each group responded that determining appropriateness and knowing when to document a source are easy; however, these attitudes should be compared to the large number of inaccurate responses to objective questions measuring these abilities.
Respondents were asked how much they enjoy doing research in general. 3% of the ND0101 students indicated they enjoy it “very much” while 28% indicate they enjoy it “very little.” Students at FYILLAA institutions, indicated more enjoyment of research with 6% indicating “very much” enjoyment and only 17% indicating “very little” enjoyment of research. Among the St. Mary’s University Advanced Composition students, 4% enjoy research “very much” while 36% enjoy it “very little.”

One way our institution is working to address this is through an annual Undergraduate Research Symposium which will enter its 10th year in Spring 2009. The past two years, the library has awarded two Undergraduate Library Research Awards in conjunction with the symposium.
Which of the following searches would retrieve the MOST results in an online search?

*movies OR films*
- ND0101 students: 18%
- EN3300 students: 22%

*movies AND films*
- ND0101 students: 51%
- EN3300 students: 60%

*Don’t know*
- ND0101 students: 19%
- EN3300 students: 14%

The students were asked several objective questions about various search strategies. All of these questions had five answer options, including a “don’t know” option.

When asked which of several options would retrieve the **most** results in an online search, 18% of the ND0101 students correctly indicated the phrase “movies OR films” would retrieve the most results. However, 51% of ND0101 students incorrectly indicated “movies AND films” would retrieve the most results, while 19% indicated they did not know. Of the Advanced Composition students, 22% correctly indicated the phrase “movies OR films” would retrieve the most results, but 60% incorrectly indicated “movies AND films” would retrieve the most results, while 14% indicated they didn’t know.

Although more advanced students answered this question correctly than new students, more advanced students also answered it incorrectly. It appears that our new students have a slightly better understanding of effectively using Boolean connectors in their online searches.
When asked which of the following was the correct way to truncate a search word, 6% of the ND0101 students correctly indicated “using the * or ! in place of the last few letters of the word,” but many new students (26%) incorrectly indicated “none of the above” while 43% indicated they did not know. Among the Advanced Composition students, 8% selected the correct response, while more students (25%) incorrectly indicated “combining search words with ‘and,’ ‘or,’ or ‘not’” and 43% indicated they did not know.

It appears that many of the Advanced Composition students confused the concepts of Boolean connectors with truncation. And many students do not seem to know what the word “truncate” means or how to do it in an online environment.

The ability to effectively use Boolean connectors and to truncate searches is not unique to library research. Other disciplines employ online databases where these search strategies are needed.
Identify the following type of item:


*Portion of a book*

- ND0101 students: 61%
- EN3300 students: 58%

The survey listed several citations and students were asked to identify the type of source it was, whether an entire book, a journal article, or a portion of a book. 61% of the ND0101 students and 58% of the Advanced Composition students incorrectly identified the journal article citation as a portion of a book.
Identify the following type of item:


Journal article

- ND0101 students: 46%
- EN3300 students: 43%

In the case of a book chapter, 46% of the ND0101 students, and 43% of the Advanced Composition students incorrectly identified it as a journal article. Sanford, Beld, and Millichap reported that 76% of the FYILLA freshmen could not differentiate a journal article from a book or book chapter, either.
Which of the following is likely to yield the most comprehensive list of relevant scholarly articles for a research project?

*Searching an electronic index or database in a specific academic field (History, Biology, Music, etc.)*

- ND0101 students: 33%
- EN3300 students: 50%

*All of the above are equally effective*

- ND0101 students: 31%
- EN3300 students: 23%

When asked which among several options were likely to yield the most comprehensive list of relevant scholarly articles for a research project, 33% of ND0101 students correctly indicated “searching an electronic index or database in a specific academic field (History, Biology, Music, etc.).” 31% of the ND0101 students indicated that “all of the above are equally effective” methods, including “using a general Internet search like Google or Yahoo,” and “searching the library catalog.”

Among the Advanced Composition students, 50% selected the most desired response, while 23% selected the “all of the above” response and 14% selected “searching the library catalog.” Of the ND0101 students, 12% selected the “don’t know” response, while 6% of the Advanced Composition students did so.
A peer-reviewed or refereed journal is BEST described as 

*A journal that publishes articles that have been approved by other scholars*

- ND0101 students: 32%
- EN3300 students: 40%

*Don’t know*

- ND0101 students: 34%
- EN3300 students: 18%

In response to a question where students were asked to select the best description of a peer-reviewed or refereed journal from among several choices, 32% of the ND0101 students selected the response “a journal that publishes articles that have been approved by other scholars” but a plurality (34%) selected “don’t know” for their response. 19% of the ND0101 students selected “a journal that includes only articles written collaboratively by peers” in response to this question. As might be expected, the Advanced Composition students fared better on this item. 40% selected the most desired response, but 29% selected “don’t know” while 18% selected “a journal that publishes reviews of other articles.” It is not surprising that new students are unfamiliar with the term “peer-reviewed.” But a substantial percentage of more advanced students also seem vague as to its meaning.
Was published in *Time, Newsweek* or *US News & World Report*

**Scholarly**
- ND0101 students: 61%
- EN3300 students: 50%

**Non-Scholarly**
- ND0101 students: 14%
- EN3300 students: 12%

The students were asked to identify for each of eight different types of resources whether the source was likely to be “scholarly,” “non-scholarly,” “can’t be determined,” or “don’t know.”

Only 14% of the ND0101 correctly identified a source that “was published in *Time, Newsweek* or *US News & World Report*” as non-scholarly while only 12% of the Advanced Composition students correctly identified this item. Among the ND0101 students, 61% indicated this type of source was likely to be scholarly, while 50% of the Advanced Composition students indicated it was scholarly. Among our new students, our results for this question were actually better than the findings of the FYILLAA institutions, which reported that 78% of their freshmen thought this was a scholarly source.
<table>
<thead>
<tr>
<th>Edwards, L. F. (1980). <em>Scarlett doesn't live here anymore: Southern women in the Civil War era.</em> Urbana, IL: University of Illinois Press.</th>
<th>15%</th>
<th>13%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schultz, J. E. (2002). Seldom thanked, never praised, and scarcely recognized: Gender and racism in Civil War hospitals. <em>Civil War History</em> 48, 220-236.</td>
<td>20%</td>
<td>17%</td>
</tr>
</tbody>
</table>

*Desired Response*

Respondents were asked to select the least appropriate source from among four items, if they were writing a research paper for an American History class examining the roles of women in the American Civil War. As you can see from Table 6, a plurality in both groups incorrectly selected the subject-specific encyclopedia, rather than the personal web page. Because students are frequently discouraged by faculty from citing information from encyclopedias, this may have led to the large number of students who selected an encyclopedia as least appropriate. This does not take into account the fact that subject-specific encyclopedias are often written by subject specialists and frequently provide a succinct entrée into discovering a topic new to the student.
Table 7. Basis of Source Selection

<table>
<thead>
<tr>
<th></th>
<th>ND0101</th>
<th>EN3300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whether the source is likely</td>
<td>32%</td>
<td>28%</td>
</tr>
<tr>
<td>to be scholarly*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How recently the source was</td>
<td>6%</td>
<td>5%</td>
</tr>
<tr>
<td>published</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whether the source was a</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>print or Internet source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The number of pages with</td>
<td>4%</td>
<td>9%</td>
</tr>
<tr>
<td>information about this topic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All of the above equally</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>influenced my response to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the preceding question</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Desired Response

When asked on what basis respondents made their selection to the question above, students responded as indicated in Table 7. The responses to this question indicate that even though students feel that judging the appropriateness of sources is easy (82% among ND0101 and 78% and EN3300), many of them do not fully understand what makes a source appropriate.
Moving from descriptive to inferential statistics, an independent samples t-test was used to determine whether or not there is a statistically significant difference in information literacy between new and advanced students. See Table 8.

Several indices, essentially a variable derived from a combination of other variables, were developed, based on objective questions from the RPS.

One index, tied to Standard 2 of the Information Literacy Competency Standards for Higher Education ("The information literate student accesses needed information effectively and efficiently"), included 4 variables measuring searching proficiency.

These variables included the responses to the question about Boolean logic, the question about truncation; a question about revising a search, based on the information included in a catalog record; and the question about how one would derive the most comprehensive list of relevant scholarly articles (which we saw earlier in Slide 22). [Questions 19 (sresults), 20 (scorrun), 21 (sefcomp), and 28 (scompart) on the RPS.]

(cont).
Another index, **ssources**, measures students’ ability to correctly identify types of resources and to indicate when it is necessary to document outside sources, and when it isn’t. This index is tied to Standard 2 and also touches on Standard 5: “The information literate student understands many of the economic, legal, and social issues surrounding the use of information and accesses and uses information ethically and legally.” This index was comprised of responses to Questions 22 (sacadjrn), 23 (sisslaps), 24 (sjrncit), 25 (sbkcit), 26 (schapcit), 27 (sprimsrc), 29 (srefjrnl), 30 (scitatio), and 31 (scitnot) on the RPS.

A third index, **seval**, included eleven measures of students’ ability to evaluate and select appropriate information. This index ties to Standard 3: “The information literate student evaluates information and its sources critically and incorporates selected information into his or her knowledge base and value system.” It included responses to Question 32a.-h. (sevalon, sevaltra, sevalpee, sevalblo, sevalrec, sevallis, sevalupu, sevalmag), 33 (sleastap), 34 (sselbasis), and 35 (sselcrit) on the RPS.

When the ND0101 students and EN3300 students were compared according to these three indices using an independent samples t-test, we found that there was no statistically significant difference on their evaluation abilities (seval), although the mean score of the EN3300 group (49.3% compared to 46.1%) was higher $t(136.078) = -1.512, p=0.13$.

There was a statistically significant difference between our upperclass students and new incoming students on measures of information literacy. However, both upperclass students and incoming students averaged below 50% on overall information literacy measures.
Figure 3 presents the mean scores as bar charts: On searching ability (ssearch) there was a statistically significant difference between advanced composition students and our new students, $t(621) = -3.658$, $p<0.05$, although both groups averaged far below 50% (36.4% among Advanced Composition students compared to 28.3% for ND0101 students).

The lowest mean scores were on searching, which may surprise our faculty, who seem to think that because our students can use technology, that they are search savvy.

Overall, there was a statistically significant difference between our upperclass students and new incoming students on measures of information literacy. However, both upperclass students and incoming students averaged below 50% on overall information literacy measures.
Differences among students from the three schools were analyzed (see Figures 4-7). We were not able to separate by rank at the upperclass student level due to the small sample sizes among Advanced Composition students.
Figure 5. Source Identification & Documentation Ability: New Student Comparisons by School

- BGSB: 40.12
- HSS: 44.82
- SET: 46.60
- Undeclared: 37.50
- Total: 44.12
Figure 6. Evaluation Ability: New Student Comparisons by School

- BGSB: 45.97
- HSS: 44.36
- SET: 48.55
- Undeclared: 40.91
- Total: 46.13
Figure 7. Overall Information Literacy Ability: New Student Comparisons by School

<table>
<thead>
<tr>
<th>School</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGSB</td>
<td>38.87</td>
</tr>
<tr>
<td>HSS</td>
<td>38.70</td>
</tr>
<tr>
<td>SET</td>
<td>41.91</td>
</tr>
<tr>
<td>Undeclared</td>
<td>34.77</td>
</tr>
<tr>
<td>Total</td>
<td>39.73</td>
</tr>
</tbody>
</table>
A one-way analysis of variance was performed (see table 9) (insert table 9). Using the Bonferroni post hoc test, the only statistically significant difference between schools appeared between students from the Bill Greehey School of Business and students from Science Engineering and Technology in the source identification and documentation ability index with a mean difference of 6.48, p=0.016.

Using the same test, there were no statistically significant differences between schools in searching ability, evaluation ability, or overall information literacy ability (where the other three indices were combined).
Suggested Next Steps:

1. Include classroom faculty from each of the three schools where our undergraduate students are located on the Information Competency Task Force. Administrative support for faculty involvement in the ICTF is needed.

2. Classroom faculty and librarians need to collaborate prior to the semester’s beginning, when learning outcomes and course activities are being established.

3. Librarians, classroom faculty, department chairs, and deans need to work together to develop a vertically-integrated plan that maps desired information literacy learning outcomes to appropriate course levels within each major.

So we have the data. Now what can we do to improve our students’ information competency skills?

We have scheduled a focus group of about 10 faculty for next month to discuss some of these findings and to hear what their recommendations are. We plan to ask these faculty to suggest faculty members to serve on the ICTF. Given the distribution of our students, this might include one faculty from the BGSB, one from SET, and two from HSS.

Librarians and teaching faculty need to cooperate in developing assignments that challenge students to gain skills in acquiring information, but also requires students to critically analyze and synthesize information.

Currently, students’ exposure to research methods instruction is “hit and miss” so that some students in a major are exposed to similar instruction methods in using the library more than once while other students never receive any formal instruction.
Sources

http://www.nitle.org/index.php/nitle/the_institute/upcoming_events/spring_2008/assessing_information_literacy_and_fluency_in_the_context_of_the_liberal_arts_campus/research_practices_survey

http://apps.carleton.edu/campus/library/about/infolit/fyillaa/