Millikin University

Student Learning in Library Research Instruction for University Seminar and Critical Writing, Reading, and Research I & II

Assessment Report for Academic Year 2014-2015

Reported by Matthew Olsen, Instructional Services Coordinator
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Summary

During the 2014-2015 academic year, Staley Library continued to use a pre-test, post-test format to assess the information literacy confidence and skills of first-year Millikin University students. Between taking the pre-test and the post-test, students receive four library instruction sessions designed to address Staley Library's four CWRR learning goals (see page 2).

All students enrolled in the University Seminar/CWRR sequence (essentially all first-year students at Millikin University) were part of the assessment. While participation varied by question, approximately 135 students took the pre-test and approximately 120 students took the post-test.

Key findings from the assessment include:

- Students showed an overall increase in their confidence with the research process and with particular information literacy skills from the pre-test to the post-test assessment.
- Students' confidence in finding and using library resources, evaluating websites and other sources, and creating citations increased the most, while their confidence defining a topic for research and sorting through irrelevant results increased the least.
- Students showed strong improvement in skills that are addressed in library instruction sessions such as identifying the purpose of the library databases or the characteristics of a scholarly journal article.
- Students' ability to narrow topics and identify unbiased information sources increased by the post-test, but represented the lowest scores on both the pre- and the post-test.
- Based on their comments, it appears that students appreciate library instruction, especially learning how to find articles, evaluate sources, and develop keywords, and they would like to learn even more about citations and evaluation of sources.
- A majority of students identified finding different types of resources as something that librarians can help them with, but also mentioned evaluating sources, narrowing topics, and using interlibrary loan.
- Three quarters of all students taking University Seminar completed the self-guided library tour and survey data indicate that a majority feel more comfortable and confident using the library by its completion.
- While the pre-, post-test format provides important longitudinal data across the first year of college, the low participation in the assessment continues to challenge the reliability of the data.

Goals

The mission of Staley Library's instruction program is to empower students to become information literate adults who are confident in their information seeking abilities and able to apply critical thinking skills in the retrieval, evaluation, and ethical use of information. The program supports the academic curriculum of Millikin University and strives to develop students who are not only successful academically, but also are prepared to find and critically use information throughout their lives.

The research instruction program corresponds directly with CWRR learning outcome goal 3: "Conduct research to participate in academic inquiry." The purpose of research instruction for CWRR is stated in Staley Library's four CWRR learning goals:

1. Students will identify the use and purpose of potential information sources and formats.
2. Students will develop and implement search strategies to retrieve resources using library and non-library tools.
3. Students will evaluate the information that they find to determine its context, value, and to identify bias or deception.
4. Students will understand ethical aspects of information and information technology.

These goals correspond to the University-wide learning goals:

1. Millikin students will prepare for professional success.
2. Millikin students will actively engage in the responsibilities of citizenship in their communities.
3. Millikin students will discover and develop a personal life of meaning and value.

Table 1 (below) shows how Staley Library's learning goals relate to University-wide learning goals:

Table 1. Staley Library's CWRR learning goals mapped to the University's learning goals

Library CWRR Learning Goal	Corresponding MU Learning Goal
Students will identify the use and purpose of potential information sources and formats.	1, 3
Students will develop and implement search strategies to retrieve resources using library and non-library tools.	1, 3
Students will evaluate the information that they find to determine its context, value, and to identify bias or deception.	1, 3
Students will understand ethical aspects of information and information technology.	2, 3

Snapshot

The research and instruction librarians devote a majority of their in-class instructional activity to the first-year core courses – CWRR and University Seminar. The librarians use a 2:2 instruction model, with two sessions in the fall and two sessions in the spring. The fall sessions are taught in either Seminar or CWRR as the course professors see fit (2 sessions per cohort); the two spring sessions are both taught in CWRR as there is no spring Seminar equivalent. The fall sessions use active learning to cover research basics and evaluating Internet sources, while the spring sessions cover more advanced topics such as evaluating types of articles, advanced keyword/topic development, and appropriate source choice for an assignment. In all cases, the librarians work with the Seminar and CWRR faculty to schedule the library session(s) appropriately so that students are able to learn, practice, and apply skills in a way that makes them immediately relevant to their research needs.

During the 2014-2015 academic year, the librarians taught 77 sessions (in 49 sections) for in-sequence CWRR classes, 22 sessions (in 22 sections) for in-sequence Seminar classes, 8 sessions (in 4 sections) for the "off-sequence" CWRR classes (i.e., CWRR I offered in the spring rather than the fall semester and CWRR II offered in the fall), and 5 sessions (in 4 sections) for the PACE CWRR classes.

Matthew Olsen coordinates the research instruction program and shares in the instruction with library faculty Rachel Bicicchi, Cindy Fuller (Library Director), and Amanda Pippitt. All library faculty, including the Instructional Services Coordinator, report to the Director.

The Learning Story

For most Millikin University students, CWRR and University Seminar are their introduction to college-level writing and research. While many first-year students are comfortable using consumer technology and finding information on the Internet, those abilities do not necessarily translate into well-developed information seeking skills or the ability to evaluate the information that they find. The librarians are the campus leaders in increasing students' information literacy skills, not only to promote academic success, but also to develop the skills necessary for life-long learning. To this end, the librarians work closely with University Seminar and CWRR faculty to tailor their instruction in such a way that it matches the course content and provides an authentic learning experience. Librarians teach students to use both library and non-library sources and stress the important of evaluating information sources no matter how they are discovered. They also focus on active learning and give students opportunities to practice the skills that they are learning.

Assessment Methods

Pre- and Post-Test Assessment Methods

The 2014-2015 academic year was the ninth complete year of data collected via a pre- and post-test. Over time, the assessment has used varied questions and methods (documented in prior instruction reports). As in past years, the pre-test was administered via Moodle before the students met with a librarian in the fall; the post-test was also administered through Moodle after the library instruction was complete in the spring. In both cases, the tests were taken outside of class time.

The sixteen questions in the first part of the assessment are based on the Project Information Literacy report, "Truth Be Told: How College Students Evaluate and Use Information in the Digital Age."[1] These questions are designed to measure students' confidence level with the academic research process (affective learning). The five point scale that students use to rank their confidence assigns tasks a range from "very difficult" to "very easy." The complete list of questions is provided in Appendix A.

The second part of the assessment has nine questions that assess the students' information literacy skills. Five of the questions are selected-response questions (multiple choice) and two of the questions are constructed-response (short answer). Question 1 on the pre-test asks students what they would like to learn in their library instruction sessions. On the post-test question 1 has two parts: "What was the most useful thing that you learned from the library sessions this year?" and "What do you wish that you would have learned?" Question 9 asks the students about the research activities that a librarian can help them with and is intended to gauge how well students understand the role of the librarian. The complete list of questions can be found in Appendix A.

[1] Head, A.J., & Eisenberg, M. B. (2010). *Truth Be Told: How College Students Evaluate and Use Information in the Digital Age* (Project Information Literacy Progress Report). Retrieved from the Project Information Literacy website: http://projectinfolit.org/images/pdfs/pil_fall2010_survey_fullreport1.pdf

To facilitate reporting of the range of answers to the short answer questions, responses to question 1 and 9 were coded into thirteen categories, all of which are listed in Appendix A. Each response was assigned up to three codes. The Instruction Coordinator and library faculty member Amanda Pippitt performed the coding. A norming session was held before they independently coded all of the responses. After review, for any responses the two librarians coded differently, the responses were discussed and the librarians agreed on common codes. Questions 3 and 5 were also graded by the Instruction Coordinator and Amanda Pippitt and the grades were averaged to assign a final grade to each response. The grading scale for questions 3 and 5 can also be found in Appendix A.

Other Forms of Evaluation

In addition to the library instruction sessions for the first-year core curriculum courses, new students have traditionally participated in a self-guided tour of the library during the first month of the fall semester. The goal of the library tour is to introduce students to the library "as place" and to familiarize them with some of the resources and services that are available in the library building. By making the tour self-guided, the librarians do not need to spend valuable in-class time performing this activity and the tour can be completed at a time that is convenient for the students. The tour has three learning goals:

1. Students will feel comfortable while researching, locating resources, studying, and relaxing in the library.
2. Students will know how to locate many of the resources available in the library.
3. Students will know who to ask if they have questions.

In fall 2014 the self-guided tour continued to use a mystery narrative format that incorporated QR (Quick Response) codes scanned by a smartphone to guide students around the library. For this year, the story and the questions were changed from the narrative that was first used in fall 2013. The tour continued to consist of a nine question worksheet with clues that were discovered by scanning QR codes located throughout the library. The clues lead participants from location to location and the worksheet has brief questions about each location. At the conclusion of the tour the worksheets were collected by library staff, graded by the librarians, and then returned to the Seminar instructors.

Academic year 2014-2015 also continued the Faculty Assessment of Library Instruction survey. This nine question electronic survey is sent to every faculty member within whose class library instruction was conducted including those outside of the Seminar/CWRR sequence. The faculty can then give anonymous or signed feedback, which the librarians use to improve library instruction. To view the survey questions please contact the Instruction Coordinator.

Assessment Data

Fall Pre-Test[2]

Part 1: Average score = 3.11 (5 point scale)
Part 2: Multiple choice: Average percentage of students answering the question correctly = 63%
Short answer: Average score = 2.09 (3 point scale)

Spring Post-Test[3]

Part 1: Average score = 3.36 (5 point scale)
Part 2: Multiple choice: Average percentage of students answering the questions correct = 70%
Short answer: Average score = 2.59 (3 point scale)

Table 2. Pre- and post-test results by library CWRR learning goal

Staley Library CWRR Learning Goals (LG)			
1. Information Sources	**2. Search Strategies**	**3. Evaluation of Information**	**4. Ethical Aspects of Information**
Part 1 **Questions 7& 8** Pre-Test Avg. = 2.9 Post-Test Avg. = 3.1 Improvement = 7%	**Part 1** **Questions 1, 2, 3, 4 & 5** Pre-Test Avg. = 3.1 Post-Test Avg. = 3.4 Improvement = 10%	**Part 1** **Questions 6, 9 & 10** Pre-Test Avg. = 3.1 Post-Test Avg. = 3.3 Improvement = 6%	**Part 1** **Questions 13, 14 & 15** Pre-Test Avg. = 3.0 Post-Test Avg. = 3.4 Improvement = 13%
Part2 **Questions 4 & 5** Pre-Test Avg. = 66% Post-Test Avg. = 85% Improvement = 29%	**Part 2** **Question 2, 6** Pre-Test Avg. = 63% Post-Test Avg. = 65% Improvement = 3%	**Part2** **Questions 3 & 7** Pre-Test Avg. = 56% Post-Test Avg. = 66% Improvement = 18%	**Part 2** **Question 8** Pre-Test Avg.= 87% Post-Test Avg.= 90% Improvement = 3%
Total for LG 1 Improvement = 18%	**Total for LG 2** Improvement = 6%	**Total for LG 3** Improvement = 12%	**Total for LG 4** Improvement = 8%

Part 1 of the assessment is designed to measure students' confidence level with the entire academic research process. Students are asked to rank on a scale from 1 (very difficult) to 5 (very easy) how they feel about different stages of the research process. Table 3 (below) and Graph 1 (Appendix B) provide a question by question listing of student scores on both the pre-test and post-test.

[2] For the pre-test the number of student responses was not the same from question to question. For Part 1 the average number of responses was 139 (mode = 139). For Part 2, the average was 133 (mode = 134). 475 students were enrolled in the pre-test Moodle assessment 'course.'

[3] The post-test also exhibited different numbers of responses from question to question. For Part 1 the average number of responses was 127 (mode = 127). For Part 2, the average was 118 (mode = 118). 382 students were enrolled in the post-test Moodle 'course.' The participation rates in the pre- and post-test and their relation to the size of the 2018 class is discussed in the *Improvement Plan* section below.

Table 3. Comparison of student ratings pre- and post-test by question for Part 1

Question **Scale 1 - 5** **1 = very difficult** **5 = very easy**	**Pre-Test Average Points** (n=139)	**Post-Test Average Points** (n=127)	**Point Change**	**Percent Change**
1. Defining a topic for the assignment	3.13	3.16	0.03	0.9%
2. Narrowing my topic	2.99	3.03	0.05	1.5%
3. Selecting search terms	3.20	3.43	0.23	7.2%
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.69	3.42	0.73	27%
5. Finding sources to use "out on the web" (example - Google, Wikipedia, websites)	3.73	3.99	0.27	7.1%
6. Determining whether a website is credible or not	3.20	3.47	0.27	8.5%
7. Figuring out where to find sources in different parts of the library	2.70	3.02	0.32	11.8%
8. Finding up-to-date materials	3.04	3.24	0.20	6.6%
9. Having to sort through all the irrelevant results I get to find what I need	2.96	2.97	0.01	0.4%
10. Evaluating the sources that I've found	3.25	3.55	0.30	9.4%
11. Reading through the material	3.54	3.74	0.20	5.5%
12. Integrating different sources from my research into my assignment	3.34	3.48	0.14	4.1%
13. Knowing when I should cite a source	3.36	3.57	0.22	6.4%
14. Knowing how to cite a source in the right format	2.80	3.37	0.57	20.4%
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	2.96	3.33	0.37	12.6%
16. Knowing whether or not I've done a good job on the assignment	2.90	3.05	0.15	5.1%
Average	**3.11**	**3.36**	**0.25**	**8.1%**

Table 4. Average number of students reporting at each level of difficulty for all questions in Part 1

Rating	**Pre-Test** (n=139)	**Post-Test** (n=127)	**Percent Change**
1 – This is very difficult	4.2%	2.5%	-41.1%
2 – This is difficult	24%	18.9%	-21.2%
3 – This is neutral	34.8%	31.7%	-8.9%
4 – This is easy	30.7%	33.7%	9.9%
5 – This is very easy	6.4%	13.2%	107.9%

Table 5 (below) and Graph 2 (Appendix B) show the percentage of students who answered each question correctly on the pre- and post-test for the five multiple choice questions in Part 2.

Table 5. Pre- and post-test comparison of percentage of students answering multiple choice questions correctly

Multiple Choice Question	Pre-Test (n=134)	Post-Test (n=118)	Percent Change
2. Keywords	69%	70%	2.5%
4. Database	70%	82%	17.2%
6. Narrowing	57%	59%	4.4%
7. Sources	34%	47%	38.8%
8. Citation	87%	90%	2.9%
Average	**63%**	**70%**	**10%**

Tables 6, 7, and 10 (below) list the number of student responses that matched a given category for questions 1 and 9 and a representative response for each category.

Table 6. Coded student responses to pre-test question 1

Pre-Test Question 1 – "What do you hope to learn from the library sessions this year?"	**Number of Student Responses** (n=134)
Other – "I hope to learn more about the library."	71
Finding resources – "The best way to find credible information that will be useful."	41
Citation – "I hope to learn how to correctly cite papers."	35
Library – "I would like to learn about where everything is in the library."	29
Finding books – "I hope to learn a easy method to finding books I need for research."	25
Evaluation of sources – "I would probably also want to know more about credible sources."	12
Finding articles – "how to navigate and utilize the databases provided by the library."	10
Don't know – "I'm not sure honestly"	1
Interlibrary loan – "I know you can request books from any other library, but I'd like to know how long that would take."	1
Keywords – "I would also hope to learn how to shorten my search titles when trying to find information on the internet."	1
Topics – "I also hope to gain the ability to easily narrow down the important information from the research and data I have collected."	1
Web – "I hope to learn how to research better on the internet"	1

Table 7. Coded student responses to post-test question 1

Post-Test Question 1.1 – "What was the most useful thing that you learned from the library sessions?"	**Number of Student Responses** (n=118)	**Post-Test Question 1.2 – "What do you wish that you would have learned?"**	**Number of Student Responses** (n=106)
Finding articles – "Figuring out about all the library databases"	42	**Nothing** – "I learned pretty much everything I had hoped for."	27
Finding resources – "I learned how to search for credible sources."	42	**Citation** – "I wish I would have learned how to site my sources properly."	16
Evaluation of sources – "The tips on determining if a source was scholarly were helpful."	20	**Evaluation of sources** – "I wish I would have learned more about knowing if a source is valuable."	12
Keywords – "The use of the right search terms to find exactly what I want"	18	**Library** – "I wish that I would have learned more about how to find sources in the library itself."	11
Library – "The most useful thing that I learned was how to navigate through the library's website"	10	**Other** – "I wish that I have grasped more knowledge about moodle."	9
Interlibrary loan – "The most useful thing I learned from the library sessions were how to reserve and 'order' books from other schools if Millikin didn't readily have what I was looking for."	7	**Web** – "I wish I would have learned how to search for credible sources on google."	9
Other – "i learned that there were many internet libraries that i could use"	5	**Finding resources** – "how to search different things "	6
Nothing – "Honestly everything she taught I already knew from high school and first week at college."	4	**Keywords** – "I wish I would have learned more how to put the right terms in to make my search easier"	5
Finding books – "How to find books in the library easier."	2	**Finding articles** – "I wish I would have learned how to find better scholarly articles."	4
Citation – "The most useful thing I learned is that how to cite sources."	1	**Finding books** – "more about the books we have"	4
Web – "The most useful thing was probably about filters - how search engines kind of choose your information for you."	1	**Don't know** – "I have no idea that I wish that I would have learned."	3
		Interlibrary loan – "I wish I would have known how to request material that cost money."	3
		Topics – "I wish I learned a little more on narrowing topics.	2

Table 8. Comparison of students' scores pre- and post-test for question 3

Question 3 – "List three criteria for deciding if a website has the credibility it needs for you to use in your research project."	**Pre-Test** (n=134)	**Post-Test** (n=116)	**Point Change**	**Percent Change**
Average (out of 3)	**2.34 (78%)**	**2.56 (85%)**	**0.22**	**9%**

Table 9. Comparison of students' scores pre- and post-test for question 5

Question 5 – "Describe three ways that scholarly journal articles differ from magazine articles or newspaper articles."	**Pre-Test** (n=132)	**Post-Test** (n=117)	**Point Change**	**Percent Change**
Average (out of 3)	**1.83 (61%)**	**2.62 (87%)**	**0.79**	**43%**

Table 10. Coded student responses to pre- and post-test question 9

Pre-Test Question 9 – "What are some research activities that a librarian can help you with?"	**Number of Student Responses** (n=132)	**Post-Test Question 9 – "What are some research activities that a librarian can help you with?"**	**Number of Student Responses** (n=114)
Finding resources – "Finding the right materials or sources to use"	53	**Finding resources** – "finding useful sources"	52
Finding books – "Finding books in the library"	52	**Finding books** – "Finding book sources"	30
Finding articles – "Suggesting specific journals or articles"	41	**Finding articles** – "navigating the databases"	29
Citation – "Citing just about everything"	35	**Library** – "finding sections of the library"	19
Evaluation of sources – "Determining if a source is credible "	25	**Keywords** – "coming up with key words/phrases to use to look up articles"	18
Library – "they help you find what you need in the library"	21	**Citation** – "Help making sure that the citation is correct"	17
Other – "How to research more effectively."	19	**Evaluation of sources** – "determine the credibility of a source"	17
Web – "showing you good ways to research credible websites on the internet"	13	**Interlibrary loan** – "Walk students through the process of ordering books from other libraries."	14
Topics – "narrowing your subject"	12	**Other** – "I wish that we would have had more help with our presentations."	9

Keywords – "learn how to narrow your search by only using the key words"	4	**Topics** – "helping narrow a topic down"	9
Don't know – "At this point I am unsure because I know next to nothing about the library on campus."	3	**Web** – "suggest helpful online resources to use"	4
Interlibrary loan – "ordering books that are not avaliable"	2	**Nothing** – "i personally did not like this activity and thought it didnt benefit me"	3
		Don't know – "I don't know."	1

Table 11. Student scores on the self-guided tour worksheet

Average Score (out of 9) (n=360)	8.1
Average Mean (out of 9) (n=360)	8.2

Table 12. Self-guided tour survey results

	Number of Student Responses	Percentage of Student Responses
How long did it take you to complete your investigation? (n=137)		
5 - 10 minutes	17	12%
10 - 15 minutes	58	42%
15 - 20 minutes	44	32%
more than 20 minutes	18	13%
Now that you have completed the investigation, do you feel more comfortable using Staley Library? (n=137)		
Yes	115	84%
No	8	6%
Not sure	14	10%
Do you feel more confident about finding library resources? (n=138)		
Yes	113	82%
No	10	7%
Not sure	15	11%
Do you know who to ask for help in the library? (n=138)		
Yes	135	98%
No	1	1%
Not sure	2	1%
How do you feel about the Dr. I.B. Smart story used in the investigation? (n=138)		
I liked it	54	39%
It was ok	66	48%
I didn't like it	4	3%
I didn't pay any attention to the story	14	10%

Similar data tables for the PACE CWRR and off-sequence CWRR classes are included in Appendices C & D below.

Analysis of Assessment Results

Looking across all of the different assessment types, students showed an improvement in every area between the pre- and post-test. In Part 1, overall student confidence in the research process increased by 0.25 points or 8%. Students showed an average 10% increase in correct answers on the multiple choice portion of Part 2 and an average .51 point or 24% increase in correct answers on the short answer questions. Mapped to the CWRR Artifact Performance Indicator Scale (where Nominal (Red-Stop) = 0-52%, Adequate (Yellow-Caution) = 53-74%, and Excellent (Green-Go) = 75-100%), for the short answer portion of Part 2 the percentage of correct answers on the post-test was well in the Excellent (Green) range of the scale (short answer = 86%). Overall, the percentage of correct answers on the multiple choice portion of Part 2 of the post-test fell in the yellow range (multiple choice = 70%), but there was a wide disparity in the percentage of correct responses. Questions 4 and 8 (on databases and citation) were in the green range (82% and 90%), questions 2 and 6 (keywords and narrowing) were in the yellow range (70% and 59%), and question 7 (sources) was in the red range (47%). With the exception of question 8 (citation) all of the multiple choice post-test scores were lower than academic year 2013-2014 and the overall percentage change from the pre- to the post-test was lower as well (17% increase last year versus 10% this year). In part this may be explained by changes to questions 6 and 7 (narrowing and sources), but questions such as number 2 (keywords), which was unchanged, showed a lower score on the post-test and a much smaller percent change between the pre- and post-test (21% increase in academic year 2013-2014 versus 2.5% this year). While the absolute scores and percentage increases between the pre- and post-test may not be as large as in past years, on the whole this year's assessment shows that students' information literacy confidence and abilities are still increasing during their first year at Millikin University.

Analysis of Assessment Results by Library Instruction Goal

Many of the questions in Parts 1 and 2 can be mapped to particular Staley Library CWRR learning goals. Students' confidence and correct answers increased across all of the learning goals (see Table 2 above), with a particularly strong increase in goals 1 and 3 (information sources and evaluation of information).

Analysis of Assessment Results for Part 1

Students' self-assessed confidence increased on all of the questions in Part 1 and on the whole increased by .25 points (8%). The greatest increase in confidence was in finding articles in the library databases (question 4), determining credibility of a website (#6), figuring out where to find sources in the library (#7), evaluating sources (#10), knowing how to cite sources in the correct format (#14) and knowing when something constitutes plagiarism (#15). Using the library databases and evaluating materials are both covered extensively in library instruction sessions and these results reflect positively on that instruction. The increased confidence in finding sources in the library may have been helped by the self-guided tour of the library. Citing sources and plagiarism are covered both in library instruction and by Seminar/CWRR faculty.

Students' confidence in their ability to define and narrow their topic (questions 1 and 2) increased a smaller percentage than other questions. In past years students' confidence has actually declined on these two questions, and the slight increase may reflect a greater awareness of the self-direction that is required in college-level writing assignments, as opposed to the defined prompts that are often given in high school. Students also showed a very modest increase (0.4%) in their confidence to sort through irrelevant results to find what they need (#9). In question 1.1 of the post-test several students expressed a desire to learn "how to refine my search." This may be an expression of students' information overload and may signify a

need for the librarians to place an even greater emphasis on refining searches and using appropriate resources. Finally, students showed the highest confidence on both the pre- and the post-test in finding sources on the open web (#5); this is a trend that we have seen in past years as well.

Table 4 (above) lists the percentage of students who provided each of the five ratings (1-5) across all of the questions on Part 1 for both the pre- and post-test. This comparison shows that fewer students responded with 1s and 2s (low confidence) and 3s (neutral) from the pre-test to the post-test, while the number of students who found tasks "easy" or "very easy" (4 or 5) increased. Overall, it does seem that students are more confident throughout the research process by the end of their second semester at Millikin University.

Analysis of Assessment Results for Part 2

Multiple Choice Questions

Question 2 asks students to determine the best keywords to use to enter a query into Google. Students showed a modest increase (2.5%) in their scores between the pre- and post-tests, and while their scores on the pre-test were relatively good (69% correct), in the past students have shown a higher increase in correct responses from the pre-test to the post-test. Keywords are covered in library instruction both in the fall and the spring, thus it would be better to see a higher increase in the scores.

Question 4 on the types of resources available in library databases showed a significant improvement (17%) between the two tests; 82% of students responded to this question correctly by the post-test. Knowing what library databases are and what can be found in them is an essential skill for scholarly researchers. Students' success acquiring this skill (which they seem to appreciate given that they mentioned learning about the databases as one of most important things that they learned in question 1 of the post-test) is an indicator of the importance of library instruction.

Question 6 asks students to narrow a given topic. Last year students scored 95% correct on both the pre- and post-test for this question, so for this year's assessment the possible responses were changed slightly to make the question more challenging. Students did score lower on the pre-test (57% correct), but unfortunately their correct responses only increased slightly on the post-test (59% correct). The majority of students' incorrect responses were split between two of the possible responses that were narrower in some ways but also broader in some ways and were certainly not the *best* way to narrow the entire topic. While enough of the students responded to this question correctly to put it in the yellow range, this question could still be improved. The question currently asks about renewable (i.e., sustainable) energy sources, which may be unfamiliar to students. This question may need to deal with a different, more familiar topic, and/or may need to provide more context for the students.

Question 7 showed the largest increase in the number of correct answers from the pre- to the post-test (39%), but the percentage of correct answers was very low on the pre-test (34%) and was the lowest of all the questions on the post-test (47% correct). This question asks students to identify an objective information source on energy drinks. The correct answer, "a peer-reviewed article in a nutrition journal," is intended to have students identify scholarly sources as factual and free from obvious bias. While the increased number of students who were able to identify this source is encouraging, the second most popular answer for both the pre- and post-tests was "a survey conducted by the American Beverage Association." While students on the pre-test may not understand what a "peer-reviewed article" refers to, the high scores on post-test Part 2 question 5 on scholarly articles shows that by the end of their first year most students do understand about scholarly articles. Nonetheless, by the post-test 40% of students still did not recognize the potential bias of an industry group conducting a survey of its own industry. Identifying bias in information sources is an advanced ability, but one that will benefit students throughout their lives. The librarians will continue to try to inculcate this difficult skill in the short time that they have with the students during their first year.

Question 8, which asks about the best time in the research process to record a citation, showed a minor increase (3%) in the number of correct responses from pre- to post-test, but student scores were high to begin with and by the post-test fully 90% of students identified correctly that citation information should be recorded the first time that you access a source. The most common incorrect answer "after you have finished writing the section of the paper that uses information from the source," indicates that students recognize the need to tie a source to their writing, but don't recognize how early in the process they should do this. The librarians will continue to stress the need to record citation information as early in the research process as possible.

Short Answer Questions

Question 1

Students' responses to question 1 in the pre-test provide important insights into their understanding and expectations of the library and scholarly research as they begin their college careers. For this reason, responses to this question were shared amongst the librarians early in the fall semester prior to meeting with the students. On the pre-test the responses tended to be rather general. Students expressed an interest in learning about the library and library resources overall, e.g., "I hope to learn more about the library." This is perhaps natural since students increasingly come from high schools with limited library facilities and may not understand the variety of resources and services offered by a university library.

When looking at the responses to question 1.1 in the post-test, students clearly appreciated learning how to use the databases to find articles. Students also appreciated learning how to find resources and they liked learning how to evaluate sources. The number of students who claimed that they learned about keywords is also encouraging as this is something that librarians stress in their instruction sessions, particularly in the spring semester.

For post-test question 1.2, a majority of students claimed that there was nothing more they could learn. While clearly not true, this may express a sense of satisfaction with the library instruction that they received. The next most popular answer, "citations," indicates that students would like to learn even more about how and when to cite sources. Interestingly, the next most popular response was evaluation of sources, which indicates that students would like to learn even more about "knowing if a source is valuable."

Question 3

Question 3 asks students to identify three criteria for deciding if a website is credible. Website credibility is a topic that is addressed directly in one of the fall library sessions and students are given criteria for evaluating websites. Students showed a 9% increase in their average score from pre- to post-test. The high initial scores on this question indicate that students are probably receiving some instruction on website evaluation before entering college. However, their responses show that their initial criteria tend to be overly focused on the URL of a website and to be binary, e.g., all .org sites are good or all .com sites are bad. One of the goals of our website evaluation instruction is to encourage students to think more deeply in their evaluation and apply the criteria with a more nuanced understanding.

Question 5

Question 5 asks students to describe three ways that scholarly journal articles differ from magazine or newspaper articles. Part of a spring library instruction session is devoted specifically to this topic and students are given criteria for distinguishing scholarly journals from other periodical types. Student scores increased from the pre- to the post-test by 43%. These results indicate that by the post-test students better

understand the characteristics of scholarly journals, which are a major source of scholarly information across the disciplines.

Question 9

Question 9, which asks about research activities that a librarian can help with, is intended in part to give a better sense of students' perceptions of the librarians both before and after the instruction sessions. The variety of activities that students identified both on the pre- and the post-test is noteworthy. Students may see finding different types of resources as the librarians' principle activity, but they also recognize that librarians can help them navigate the physical library, retrieve materials from other libraries, develop keywords for searches, cite correctly, and evaluate sources.

Analysis of Survey Results for Self-Guided Tour

There were 138 unique responses to the survey that students could complete after taking the self-guided tour. This is three times more students than completed the survey the previous year and approximately 38% of the 360 students who completed the tour. For this year the survey was posted next to the last question on the tour (rather than distributed as a handout that students received at the conclusion of the tour), which clearly increased participation. A large majority of respondents claimed to have met the tour's learning goals of making students feel more comfortable in the library, more confident using library resources, and more knowledgeable about who to ask for help in the library. It is important to note that the survey was optional and these self-selected responses may not represent the majority of students who completed the tour.

This year the librarians also recorded the scores for the worksheet that students complete during the tour. 360 worksheets were collected by the librarians and the average score was 8.1 out of 9. Based on a class of 475 this means that approximately 75% of first year students completed the self-guided tour. A self-guided tour is a very efficient way to introduce students to the physical library. The challenge is making the tour engaging enough that students actively seek out new areas of the library and remember the areas that they visited. The high average score on the worksheet shows that most students were able to answer the questions posed at each stop on the tour.

Analysis of Assessment Results for PACE and Off-Sequence CWRR classes

This year data were collected from three PACE CWRR classes (one CWRR I and two CWRR II classes), two off-sequence CWRR I sections, and two off-sequence CWRR II sections. Collecting reliable data from these classes is challenging for a number of reasons. Not all students who take PACE CWRR II have taken CWRR I, which undermines the design of the pre- and post-test. Also, the off-sequence CWRR sections are a mix of transfer students, international students, and students retaking CWRR. The pre-test is designed to be taken prior to any library instruction, which is challenged by the composition of these classes. Finally, the brief PACE semester sometimes makes scheduling the pre- and post-test challenging.

The results from the PACE CWRR classes generally matched the trends found in the traditional CWRR classes. Students demonstrated increased confidence in the research process from the pre- to the post-test, and although their degree of confidence was lower in the pre-test the increase was larger by the post-test (almost 20%). Like the traditional classes, they showed the largest increases in confidence in using the databases, evaluating sources, and citations. However, they also showed a large increase in their confidence in evaluating websites. For Part 2, they showed a larger increase from the pre- to the post-test on both the multiple choice and short answer portions, although their scores on both were lower than the traditional students. The increase by approximately 150% on questions 3 and 5 is particularly noteworthy.

Students in the off-sequence CWRR classes expressed higher confidence in the research process in the pre-test than the traditional students. However, their overall confidence decreased slightly on the post-test, although they expressed increased confidence in using the databases and effectively sorting through irrelevant results. For Part 2 their scores started off lower than the traditional students, but increased more than the traditional students in many cases and their post-test scores tended to be higher as well. For example, the scores on the multiple choice questions of Part 2 averaged 44% correct on the post-test (compared to 63% for the traditional students), but increased by 67% to 73% by the post-test, which compares favorably to the 70% correct for the traditional students. As mentioned above, the composition of the off-sequence CWRR classes is extremely varied and typically yield results on the pre- and the post-test that are different than the other cohorts.

Improvement Plan

An ongoing challenge with the library assessment is the lack of participation, especially in the post-test. This year was unusual in that the pre- and the post-test had similar participation rates. In fact, because enrollment in CWRR II is smaller in CWRR I, in relative terms more students participated in the post-test (32%) than the pre-test (29%). Typically, many more students take the pre-test assessment than the post-test assessment. While it is possible to make comparisons across the two tests, these low participation rates do challenge the overall confidence in the results. Because the test is administered outside of class there is also a danger that participation is self-selecting and the results do not represent an authentic cross-section of the class of 2018. The advantage of this format is that the assessment can be administered without sacrificing instruction time and on balance this factor may outweigh the lack of participation. Nonetheless, the Instruction Coordinator will continue to stress the importance of the assessment to both students and faculty.

As mentioned above, capturing data from the PACE and off-sequence CWRR classes is always challenging, but this year all of the off-sequence CWRR classes participated and 3 out of the 4 PACE classes participated as well. The Instruction Coordinator will continue his efforts to have all CWRR classes participate in the assessment.

The self-guided tour retained largely the same format, and the revised story was viewed mostly positively by the students with 87% of students saying they either liked the story or thought it was ok. Placing the survey at the end of the tour rather than as a separate handout at the conclusion was clearly a success with three times as many students completing the survey as last year. Another improvement goal from last year was to capture the students' scores from the worksheets. That was done successfully and the (positive) results are included in Table 11 above. Recording these scores had the added benefit of giving us a more accurate count of how many students completed the tour.

Last year was the first time that other librarians assisted with the coding and grading of the constructed-response questions in Part 2 of the assessment. Having multiple coders/graders helps with the reliability of the data. This year one librarian, Amanda Pippitt, worked with Matthew Olsen to grade and code the responses, and we held a norming session before working with the questions independently. Having multiple people work through the results of the assessment also helps to diagnose problems with the assessment and to suggest fruitful improvements. This format with multiple coders/graders and a norming session was successful and will be continued in the future.

Finally, a few of the questions in Part 2 of the assessment may need revision before the next academic year. Questions 3 and 5 were revised slightly for this assessment – question 3 added a specific number of criteria for evaluating websites and question 5 asked students to compare scholarly journal articles to magazines or newspapers, which we hoped would be clearer for students. These were improvements but the responses to these questions still continued to be frustratingly brief at times, e.g., "Author Date, copyright" for question 3 or "style, sophistication, length" for question 5. The librarians will continue to explore ways

to phrase these questions such that the students are encouraged to give more complete answers. Question 6 on narrowing topics was made more challenging this year by the inclusion of new possible responses. The poor performance on this question on the post-test shows that not only do the librarians need to do more work on this topic with students, but also may need to make some changes to the question and/or responses. Question 7 on credible sources was also challenging to students as it has been in the past. This may require more in-class time devoted to explaining the potential bias of companies and organizations. Finally, question 9 on the role of the librarian, which was new in last year's assessment, yields interesting responses but may need to be reworded. Some students on the post-test misinterpreted this question as asking how satisfied they were working with their librarian, i.e., a restatement of question 1. To avoid responses like "None, I benefited from the session with the librarian" it may be necessary to make this question ask about the research activities that *any* librarian can assist *any* student with.

Conclusion

On the whole, the assessment of library instruction in Seminar/CWRR indicates that students are learning important information literacy skills over the course of their first year at Millikin University. Finding, evaluating, and using information effectively and ethically are important 21st century skills and are skills that library faculty are uniquely qualified to develop in students across the curriculum. The close relationship that library faculty enjoy with faculty members across campus allows them to provide instruction in a way that is most beneficial to students. In particular with Seminar/CWRR, the opportunity to meet with cohorts on several occasions allows the librarians to introduce and then reinforce multiple concepts with the students. The librarians continue to stress the idea of research as a process and to develop higher order information literacy abilities while reinforcing the more fundamental skills. The library faculty look forward to working again with their CWRR and Seminar colleagues during the 2015-2016 academic year.

Appendix A

Pre- and Post-Test Questions

Part 1

When you think about the ENTIRE research process—from the moment you get the assignment until you turn in your research paper—what is the level of difficulty for the following tasks? [Scale of 1 to 5: 1 – Very difficult, 2 – Difficult, 3 – Neutral, 4 – Easy, 5 – Very easy]

1. Defining a topic for the assignment.
2. Narrowing my topic.
3. Selecting search terms.
4. Finding articles in the research databases on the Library's website. (EBSCO, JSTOR, ProQuest, etc.)
5. Finding sources to use "out on the web" (using Google, Wikipedia, or other search sites).
6. Determining whether a website is credible or not.
7. Figuring out where to find sources in different parts of the library.
8. Finding up-to-date materials.
9. Having to sort through all the irrelevant results I get to find what I need.
10. Evaluating the sources that I've found.
11. Reading and understanding the material.
12. Integrating different sources from my research into my assignment.
13. Knowing when I should cite a source.
14. Knowing how to cite a source in the right format.
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism.
16. Knowing whether or not I've done a good job on the assignment.

Part 2

(Correct answers are indicated in italics)

1. (Pre-Test) This year, a librarian will visit your CWRR and Seminar classes to begin talking about Information Literacy.
   What do you hope to learn from the library sessions this year?

1. (Post-Test) This year, a librarian visited your CWRR classes to begin talking about Information Literacy.
   1. What was the most useful thing that you learned from the library sessions?
   2. What do you wish that you would have learned?

2. You are asked to write a research paper addressing the following question: "Should colleges be allowed to restrict student speech?"
   You have decided to do a Google search using two keywords.
   Which two keywords will get the best results?
   College and censorship
   College and student
   College and speech
   College and restriction

3. List **three** criteria for deciding if a website has the credibility it needs for you to use in your research project.

4. If you are searching in the database "Academic Search Premier" as seen in the image below, what type of research resources should you expect to find in your results?
    Journal Articles
    Books

5. Describe **three** ways that scholarly journal articles differ from magazine articles or newspaper articles.

6. You have been assigned a research paper on the topic of renewable (sometimes called sustainable) energy sources. Of the following, which is the **best** way to **narrow** this topic?
    Focus on the history of electricity generation in the United States.
    Focus on the pros and cons of solar energy.
    Focus on sustainability initiatives in Germany.
    Focus on the optimal height for wind turbines in Illinois.

7. You are doing research for a speech on the potential health benefits and drawbacks of energy drinks (Monster, Red Bull, etc.). Which source is most likely to have **objective and accurate** information on this topic?
    A discussion of energy drinks on Yahoo! Answers.
    A survey conducted by the American Beverage Association.
    A website for one of the energy drink manufacturers.
    A peer-reviewed article in a nutrition journal.

8. When is the best time in the research process to make note of the details about your source (author, title, date, etc.)?
    The first time you access a source you might want to use.
    After you have finished writing the section of the paper that uses information from a source.
    When the teacher asks you for proof that you did not plagiarize the information in the paper.
    When you are getting ready to print your final draft.

9. What are some research activities that a librarian can help you with?

Categories for Part 2, Questions 1 & 9

A = Finding articles (also using databases)

B = Finding books (and other print materials)

C = Citation (also plagiarism)

D = Don't know

E = Evaluation of sources

I = Interlibrary loan

K = Keywords (development or selection)

L = Library – navigating the physical library or website

N = Nothing

O = Other – entire research process, writing, information literacy, etc. [use for very broad answers]

R = Finding (credible) (re)sources [use if they don't specify format or mention the library "database"]

T = Topics – defining, narrowing, etc.

W = Web – using Google, Bing, Wikipedia, etc.

X = No answer

Grading Scale for Part 2, Question 3

0 = No correct criteria, "I don't know" or similar answer

1 = One correct criterion

2 = Two correct criteria

3 = Three correct criteria

Grading Scale for Part 2, Question 5

0 = No differences correctly identified, "I don't know" or similar answer

1 = One difference correctly identified

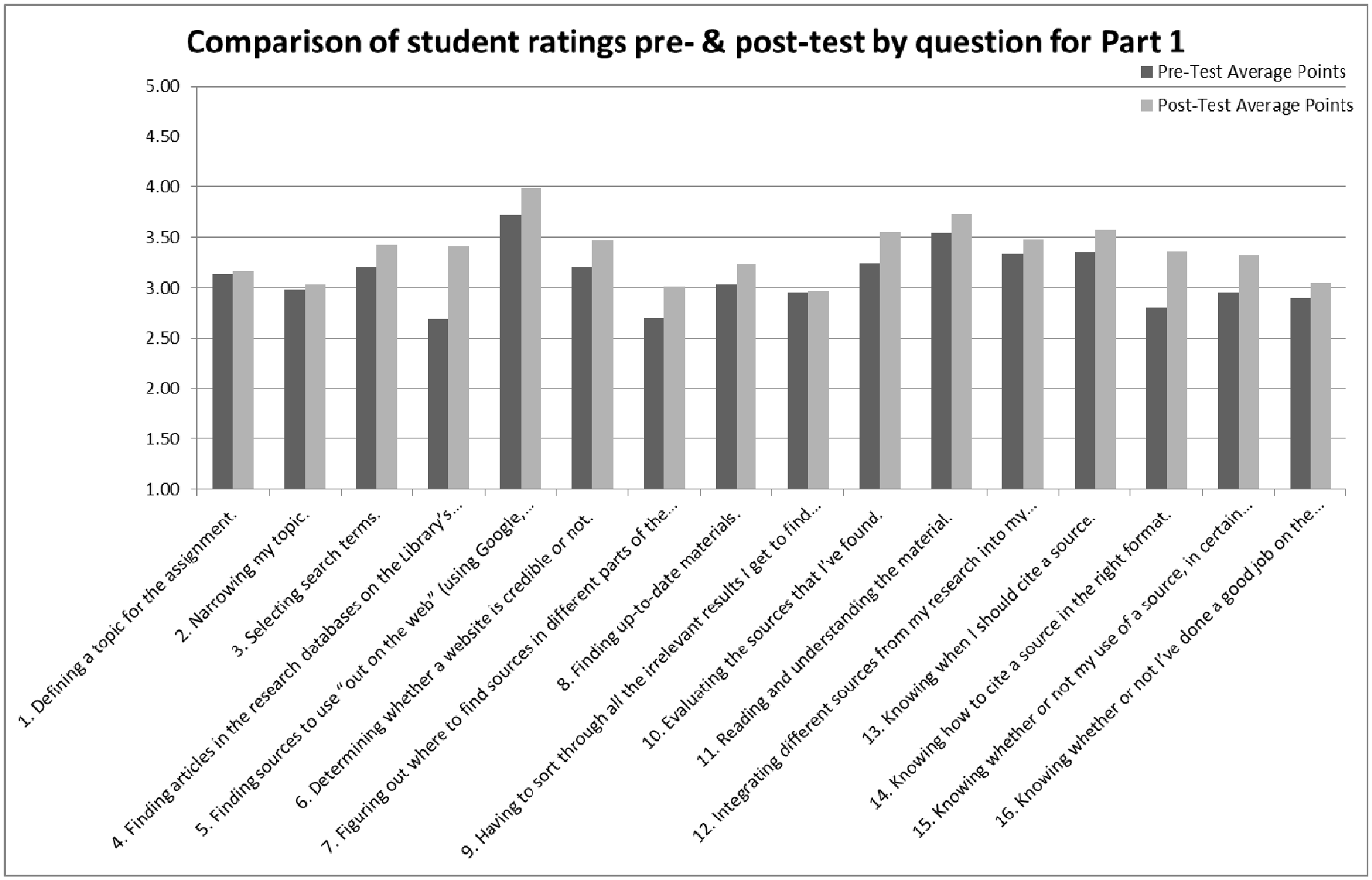
2 = Two differences correctly identified

3 = Three differences correctly identified

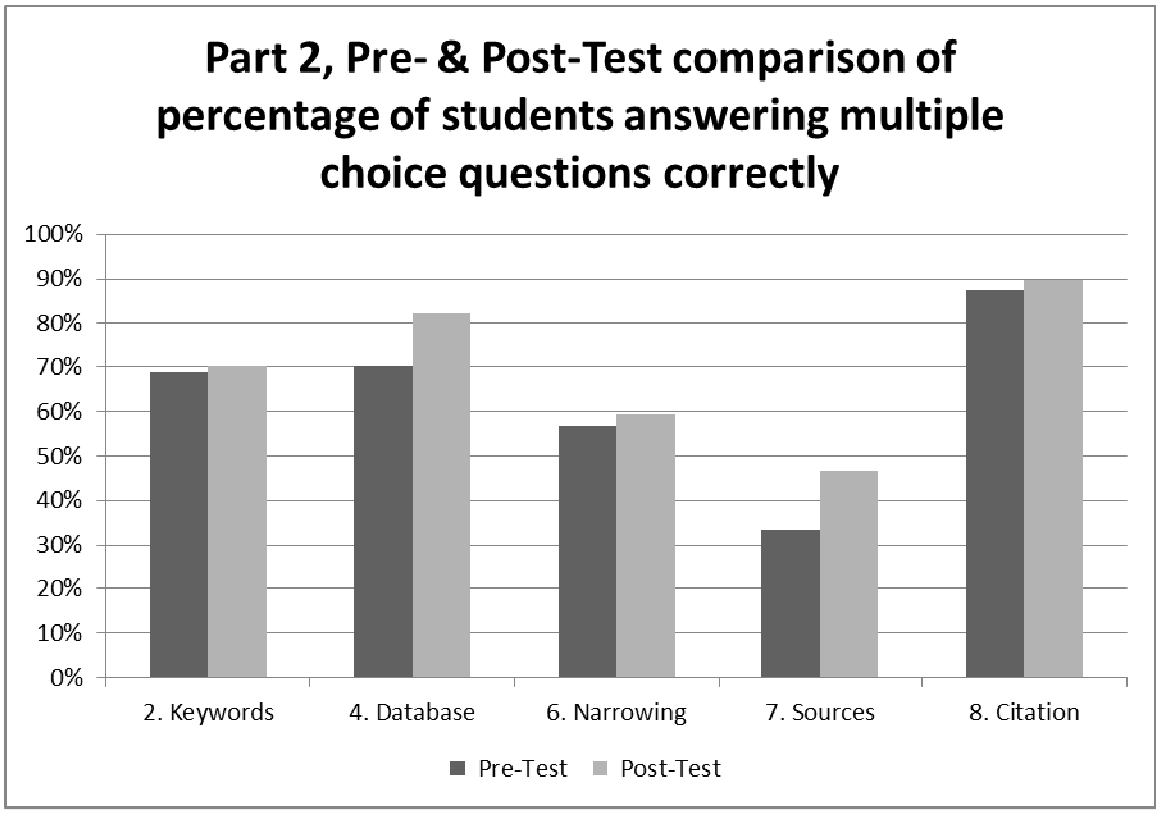
Appendix B

Graphical Representation of Pre- and Post-Test Results

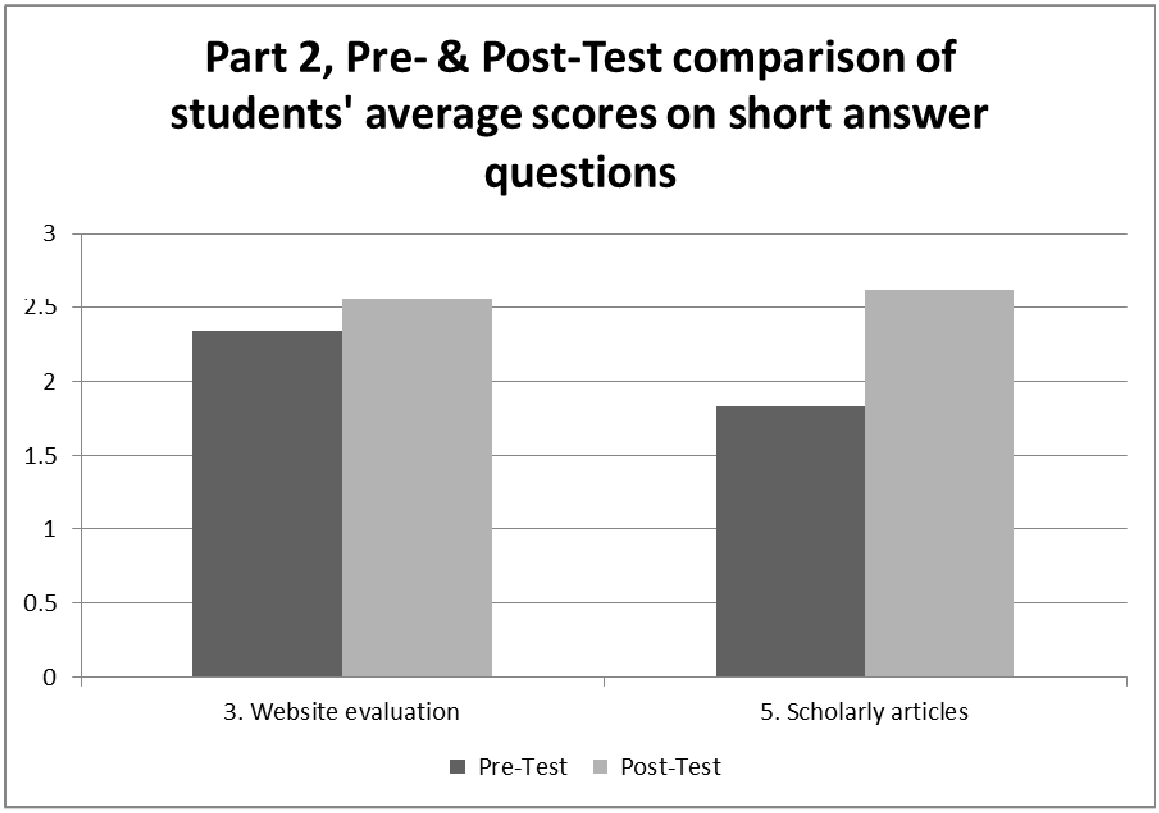
Graph 1


Comparison of student ratings pre- & post-test by question for Part 1
Pre-Test Average Points
Post-Test Average Points
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
1. Defining a topic for the assignment.
2. Narrowing my topic.
3. Selecting search terms.
4. Finding articles in the research databases on the Library's...
5. Finding sources to use "out on the web" (using Google,...
6. Determining whether a website is credible or not.
7. Figuring out where to find sources in different parts of the...
8. Finding up-to-date materials.
9. Having to sort through all the irrelevant results I get to find...
10. Evaluating the sources that I've found.
11. Reading and understanding the material.
12. Integrating different sources from my research into my...
13. Knowing when I should cite a source.
14. Knowing how to cite a source in the right format.
15. Knowing whether or not my use of a source, in certain...
16. Knowing whether or not I've done a good job on the...

Graph 2



Graph 3



Appendix C

PACE CWRR Results[4]

Part 1

Table C.1. Comparison of student ratings by question for Part 1

Question **Scale 1 - 5** **1 = very difficult** **5 = very easy**	**Pre-Test Average Points** (n=7)	**Post-Test Average Points** (n=19)	**Point Change**	**Percent Change**
1. Defining a topic for the assignment	3.86	3.51	-0.35	-9%
2. Narrowing my topic	3.43	3.23	-0.20	-5.7%
3. Selecting search terms	3.29	3.69	0.41	12.4%
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.43	3.83	1.4	57.7%
5. Finding sources to use "out on the web" (using Google, Wikipedia, or other search sites)	3.71	4.34	0.63	16.9%
6. Determining whether a website is credible or not	2.57	3.65	1.08	41.9%
7. Figuring out where to find sources in different parts of the library	2.57	3.4	0.83	32.1%
8. Finding up-to-date materials	2.86	3.94	1.08	37.8%
9. Having to sort through all the irrelevant results I get to find what I need	2.71	3.76	1.04	38.4%
10. Evaluating the sources that I've found	2.86	4.02	1.16	40.6%
11. Reading and understanding the material	4	4.13	0.13	3.1%
12. Integrating different sources from my research into my assignment	3.57	3.72	0.15	4.2%
13. Knowing when I should cite a source	2.86	3.45	0.59	20.7%
14. Knowing how to cite a source in the right format	2.86	2.95	0.10	3.4%
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	3	3.48	0.48	16.1%
16. Knowing whether or not I've done a good job on the assignment	2.86	2.88	0.02	0.8%
Average	**3.09**	**3.62**	**0.53**	**17.3%**

[4] The PACE CWRR results are the average of the results of two post-tests (fall and spring semester) and one pre-test in the spring semester.

Table C.2. Average number of students reporting at each level of difficulty for all questions in Part 1

Rating	Pre-Test (n=7)	Post-Test (n=19)	Percent Change
1 – This is very difficult	7.1%	1.7%	-76.1%
2 – This is difficult	18.8%	14%	-25.2%
3 – This is neutral	37.5%	23.7%	-36.8%
4 – This is easy	31.3%	41.4%	32.4%
5 – This is very easy	5.4%	19.2%	258.6%

Part 2

Table C.3. Pre- and post-test comparison of percentage of students answering each multiple choice question correctly

Multiple Choice Question	Pre-Test (n=8)	Post-Test (n=20)	Percent Change
2. Keywords	63%	65%	3.3%
4. Database	63%	77%	23.3%
5. Narrowing	50%	50%	0%
7. Sources	38%	48%	27.8%
8. Citation	50%	79%	58.3%
Average	**53%**	**64%**	**21.4%**

Table C.4. Coded student responses to pre-test question 1

Pre-Test Question 1 – "What do you hope to learn from the library sessions this year?"	**Number of Student Responses** (n=8)
Other – "How to use the library to research topics for papers."	4
Finding resources – "I hope to learn how to research resources for my papers correctly."	3
Finding articles – "I hope to learn have to navigate throughout the library database to find my sources needed in my research paper."	1
Finding books – "How to look up information by … books"	1
Citation – "citing resources accurately and correctly is something that I want to achieve"	1
Evaluation of sources – "be able to determine which sources are credible"	1
Web – "How to look up information by internet"	1

Table C.5. Coded student responses to post-test question 1

Post-Test Question 1.1 - What was the most useful thing that you learned from the library session this year?	**Number of Student Responses** (n=20)	**Post-Test Question 1.2 - What do you wish that you would have learned?**	**Number of Student Responses** (n=13)
Finding resources – "Various sites to locate sources."	7	**Nothing** – "I cannot think of anything that I wish I could have learned."	6
Finding articles – "How to use the Staley research databases."	6	**Other** – "Wish we would have had the librarian for a little bit longer."	4
Library – "I learned about the library and how to use it online."	4	**Library** – "It would have been nice to include a tour of the physical library as well."	2
Finding books – "The most useful thing that I learned from the library session was how to locate books."	3	**Evaluation of sources** – "A little more on how to tell which is a legitimate site and what is not."	1
Other – "I did not know about the drop box on MyMillikin."	3		
Citation – "Having a person to ask questions about citations is very valuable."	1		
Evaluation of sources – "I learned how to identify sources as being useful or not."	1		
Interlibrary loan – "The other handy tool is how to borrow books from other libraries."	1		
Keywords – "search multiple topics in one search"	1		

Table C.6. Comparison of students' scores pre- and post-test for question 3

Question 3 – "List three criteria for deciding if a website has the credibility it needs for you to use in your research project."	**Pre-Test** (n = 8)	**Post-Test** (n = 19)	**Point Change**	**Percent Change**
Average (out of 3)	**0.88 (29%)**	**2.2 (73%)**	**1.32**	**150%**

Table C.7. Comparison of students' scores pre- and post-test for question 5

Question 5 – "Describe three ways that scholarly journal articles differ from magazine articles or newspaper articles."	**Pre-Test** (n = 8)	**Post-Test** (n = 19)	**Point Change**	**Percent Change**
Average (out of 3)	**1.06 (35%)**	**2.6 (87%)**	**1.54**	**145%**

Table C.8. Coded student responses to pre- and post-test question 9

Pre-Test Question 9 – "What are some research activities that a librarian can help you with?"	**Number of Student Responses** (n=7)	**Post-Test Question 9 – "What are some research activities that a librarian can help you with?"**	**Number of Student Responses** (n=20)
Finding resources – "finding credible sources"	4	**Finding resources** – "Finding sources"	7
Citation – "Proper citation"	2	**Finding books** - "finding books on your topic"	6
Evaluation of sources – "HOW TO PICK THE RIGHT ONE"	2	**Citation** – "how to cite"	5
Finding articles – "I will need help with know how to access the journals."	1	**Other** – "Every aspect of researching"	5
Finding books – "how to look for certain books"	1	**Finding articles** – "Learning how to use the library's databases."	4
Web – "researching material on the internet"	1	**Topics** – "Narrow a topic down to write about."	4
		Library – "Locating physical resources located in the library."	3
		Evaluation of sources – "helping us know whether articles are good sources or not"	1
		Interlibrary loan – "Articles or resources not maintained by the university"	1
		Keywords – "key word search"	1

Appendix D

Off-Sequence CWRR Results[5]

Part 1

Table D.1. Comparison of student ratings by question for Part 1 of the pre-test

Question **Scale 1 - 5** **1 = very difficult** **5 = very easy**	**Pre-Test Average Points** (n=18)	**Post-Test Average Points** (n=28)	**Point Change**	**Percent Change**
1. Defining a topic for the assignment	3.28	3.29	0.01	0.2%
2. Narrowing my topic	3.06	2.89	-0.16	-5.3%
3. Selecting search terms	3.5	3.18	-0.32	-9.2%
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.94	3.5	0.56	18.9%
5. Finding sources to use "out on the web" (using Google, Wikipedia, or other search sites)	3.89	3.96	0.08	1.9%
6. Determining whether a website is credible or not	3.47	3.36	-0.11	-3.3%
7. Figuring out where to find sources in different parts of the library	3.06	2.93	-0.13	-4.2%
8. Finding up-to-date materials	3.61	3.54	-0.08	-2.1%
9. Having to sort through all the irrelevant results I get to find what I need	3	3.21	0.21	7.1%
10. Evaluating the sources that I've found	3.5	3.36	-0.14	-4.1%
11. Reading and understanding the material	3.88	3.61	-0.28	-7.1%
12. Integrating different sources from my research into my assignment	3.53	3.29	-0.24	-6.9%
13. Knowing when I should cite a source	3.44	3.54	0.09	2.6%
14. Knowing how to cite a source in the right format	3.33	3.39	0.06	1.8%
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	3.33	3.29	-0.05	-1.4%
16. Knowing whether or not I've done a good job on the assignment	3.06	3.11	0.05	1.7%
Average	**3.37**	**3.34**	**-0.03**	**-0.8%**

[5] The off-sequence results are from two sections of CWRR I in spring 2015 and two sections of CWRR II in fall 2014.

Table D.2. Average number of students reporting at each level of difficulty for all questions in Part 1

Rating	Pre-Test (n=18)	Post-Test (n=28)	Percent Change
1 – This is very difficult	0.7%	2%	189.3%
2 – This is difficult	13.6%	16.1%	18%
3 – This is neutral	43.4%	39.5%	-9%
4 – This is easy	32.8%	30.8%	-6%
5 – This is very easy	9.5%	11.6%	22.2%

Part 2

Table D.3. Comparison of percentage of students answering multiple choice question correctly

Multiple Choice Question	Pre-Test (n=17)	Post-Test (n=27)	Percent Change
2. Keywords	47%	59%	25.9%
4. Database	53%	96%	81.9%
5. Narrowing	29%	59%	101.5%
7. Sources	35%	59%	67.9%
8. Citation	53%	89%	67.9%
Average	**44%**	**73%**	**66.8%**

Table D.4. Coded student responses to question 1

Pre-Test Question 1 – "What do you hope to learn from the library sessions this year?"	**Number of Student Responses** (n=16)
Other – "I would expect to learn information about Literature and the origin of it."	6
Finding resources – "How to find good sources for papers."	5
Finding books – "I hope to learn how to find books in the library quicker and easier."	3
Library – "I also want to be able to locate anything in the library without getting lost."	3
Finding articles – "The best ways to find relevant/required information … through online databases"	1
Citation – "I hope to better know how to cite my sources in different formats"	1
Evaluation of sources – "I hope to learn how to narrow down which sources are the most credible."	1
Nothing	1

Table D.5. Coded student responses to post-test question 1

Post-Test Question 1.1 - What was the most useful thing that you learned from the library session this year?	**Number of Student Responses** (n=27)	**Post-Test Question 1.2 - What do you wish that you would have learned?**	**Number of Student Responses** (n=25)
Finding resources – "Where to find resources outside of the Internet"	12	**Nothing** – "There is not anything I wish I could I have learned that was not in any of the sessions."	12
Evaluation of sources – "the most usefull thing i learned was what kinds of sources were crediable and not crediable."	8	**Citation** – "I wish i would have learned more on the MLA, APA, and CMS citiations."	4
Finding articles – "How to use EBSCO Host"	5	**Interlibrary loan** – "I wish we would have learned more about how to rent books from other libraries and how to make better use of that."	2
Finding books - "The ability to have the call number text to your phone"	4	**Other** – "I wish we had more time to review more of the resources."	2
Interlibrary loan – "The most useful thing I've learned was how to ask for an article if the full PDF wasn't given."	2	**Finding books** – " i wish i could have learned more on what kinds of ways to find books in the library because i dont ussally go to the library to check out books."	1
Keyword – "The most useful thing I learned from the library session is how minimize your search field by using key words instead of full title searches, which will give you minimal results."	2	**Evaluation of sources –** "More ways to discern useful information vs. not useful information"	1
Other – "The most useful thing I learned about was how to incorporate different types of sources into my research paper."	2	**Keywords** – "How to find the hot words in your topic to search effectively."	1
Citation – "The librarian was helpful with reviewing MLA format."	1	**Finding resources** – "It was informal on different types of information i can personally search through."	1
Nothing – "We learned everything that I knew already."	1	**Topics** – "I wish that we would have learned about problems that you may face if your topic is more recent."	1

Table D.6. Comparison of students' scores pre- and post-test for question 3

Question 3 – "List three criteria for deciding if a website has the credibility it needs for you to use in your research project."	**Pre-Test** (n=16)	**Post-Test** (n=27)	**Point Change**	**Percent Change**
Average (out of 3)	**1.91 (64%)**	**2.44 (81%)**	**0.53**	**28%**

Table D.7. Comparison of students' scores pre- and post-test for question 5

Question 5 – "Describe three ways that scholarly journal articles differ from magazine articles or newspaper articles."	**Pre-Test** (n=15)	**Post-Test** (n=27)	**Point Change**	**Percent Change**
Average (out of 3)	**1.53 (51%)**	**2.74 (91%)**	**1.21**	**79%**

Table D.8. Coded student responses to pre- and post-test question 9

Pre-Test Question 9 – "What are some research activities that a librarian can help you with?"	**Number of Student Responses** (n=16)	**Post-Test Question 9 – "What are some research activities that a librarian can help you with?"**	**Number of Student Responses** (n=26)
Finding books – "Librarians helped me find out call numbers"	4	**Finding books** – "finding books in the library "	11
Finding resources – "The librarian can help me with learning how to find what i need for a specific subject in the library."	4	**Finding resources** – "Help find other sources."	10
Citation – "help with the correct way to cite."	3	**Finding articles** – "Finding a useful article for my research paper."	6
Other – "Taking notes on the material wanting to be used."	3	**Evaluation of sources** – "help me to see if a source has credibility or not"	6
Finding articles – "Searching through academic journals."	2	**Citation** – "help you cite those sources properly"	4
Library – "Where and how to look for relevant information in the library"	2	**Library** - "finding my sources in the library"	3
Topics – "How to narrow a topic down"	2	**Other** – "my histroy papaer and criter papers"	3
Evaluation of sources – "How to tell if something is credible"	1	**Interlibrary loan** – "Loaning books from other schools."	2

Keywords – "How to search key words"	1	**Keywords** – "They will help you with search words to narrow down your search so you can find credible sources fast."	1
Nothing	1	**Topics** – "find accurate information that can narrow down my search for particular information"	1