Millikin University

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

Assessment Report for Academic Year 2016-2017

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Summary

During the 2016-2017 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.

All students enrolled in the University Seminar/CWRR sequence (essentially all first-year students at Millikin University) were included in the assessment. While participation varied by question, approximately 155 students took the pre-test and approximately 140 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, although the scores were generally lower and the increases smaller than last year. On average, the scores were in the high yellow range on the CWRR Artifact Performance Indicator Scale.
- Students' confidence and skills in the research process increased for all 4 of Staley Library's CWRR learning goals, in particular identifying information sources and evaluating information.
- Students' confidence in finding and using library resources (particularly library databases), evaluating sources, and knowing how to cite sources increased the most, while their confidence defining finding sources "out on the web," narrowing topics, and defining topics, either decreased or increased very slightly.
- 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 determine keywords and to identify unbiased information sources increased by the post-test, but these questions had 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 and to develop, and their comments should that they would like to learn even more about citations and evaluation of sources.
- Students showed a more developed conception of how librarians can help them with their research by the time of the post-test, and while a majority of students identified finding different types of resources as something that librarians can help them with, they also mentioned citations, developing topics, and evaluating sources.
- Over half of all students taking University Seminar completed the virtual library tour and those who responded to the associated survey indicated that they felt more comfortable and confident using the library after completing the tour.

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 critically and ethically 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 CWRR 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

Staley Library faculty 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), but usually one session is taught in each of the classes; 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 2016-2017 academic year, the librarians taught 66 sessions (in 47 sections) for CWRR classes, 26 sessions (in 26 sections) for Seminar classes, 4 sessions (in 2 sections) for the "off-sequence" CWRR classes (i.e., CWRR II offered in the fall rather than the spring semester and CWRR I offered in the spring), and 2 sessions (in 2 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 and evaluation skills. The library faculty 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 so that it matches the course content and provides an authentic learning experience for students. Librarians teach students to use both the specialized scholarly research resources found in the library and non-library sources, and they stress the importance 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 2016-2017 academic year was the eleventh complete year of data collected via a pre- and post-test. As in previous 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 the library instruction 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 consists of seven 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). There are two additional questions in Part 2 of the assessment. Question 1 on the pre-test is a short answer question that 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 is another short answer question that 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://www.projectinfolit.org/uploads/2/7/5/4/27541717/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 Rachel Bicicchi 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 Rachel Bicicchi 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. 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.

Fall 2016 presented a challenge to our usual format for the tour because the library had moved to its temporary location in New Hall 3 during the University Commons construction. New Hall 3 is not conducive to groups of students moving through the building, and the librarians wanted to share information about the off-site storage facility, which is not accessible to students. Thus, we created a virtual tour of the library using the LibGuides platform. The tour consisted of five 'pages' of photos and text, each corresponding to different areas of the library. The tour also had two videos explaining how to access the library's website and how to request materials from the off-site storage facility. After finishing the tour, students completed a ten question worksheet that tested their comprehension of the material. Students also had the option to respond to a five question survey. Upon completion the worksheets were turned in at the library, graded by the librarians, and then returned to the Seminar instructors. The worksheet scores are reported in Table 11 below and the results of the survey are reported in Table 12.

Academic year 2016-2017 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 = 3.1 (5 point scale)
Part 2: Multiple choice: Average percentage of students answering the question correctly = 63%
Short answer: Average score = 2.04 (3 point scale)

Spring Post-Test[3]

Part 1: Average score = 3.37 (5 point scale)
Part 2: Multiple choice: Average percentage of students answering the questions correctly = 70%
Short answer: Average score = 2.18 (3 point scale)

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

Staley Library CWRR Learning Goals (LG)			
1. Information Sources **Part 1** **Questions 7& 8** Pre-Test Avg. = 2.9 Post-Test Avg. = 3.1 Improvement = 7% **Part 2** **Questions 4 & 5** Pre-Test Avg. = 65% Post-Test Avg. = 80% Improvement = 22% **Total for LG 1** Improvement = 15%	**2. Search Strategies** **Part 1** **Questions 1, 2, 3, 4 & 5** Pre-Test Avg. = 3.1 Post-Test Avg. = 3.3 Improvement = 7% **Part 2** **Question 2 & 6** Pre-Test Avg. = 66% Post-Test Avg. = 69% Improvement = 4% **Total for LG 2** Improvement = 6%	**3. Evaluation of Information** **Part 1** **Questions 6, 9 & 10** Pre-Test Avg. = 3.0 Post-Test Avg. = 3.4 Improvement = 11% **Part 2** **Questions 3 & 7** Pre-Test Avg. = 57% Post-Test Avg. = 62% Improvement = 10% **Total for LG 3** Improvement = 11%	**4. Ethical Aspects of Information** **Part 1** **Questions 13, 14 & 15** Pre-Test Avg. = 3.2 Post-Test Avg. = 3.5 Improvement = 11% **Part 2** **Question 8** Pre-Test Avg.= 77% Post-Test Avg.= 74% Improvement = -4% **Total for LG 4** Improvement = 4%

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, and Table 4 (below) shows the average number of responses at each level of difficulty for all questions in part 1.

[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 161 (mode = 161). For Part 2, questions 2-8 the average was 147 (mode = 149). The freshman census taken after the first week of classes was 448 students and 456 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 145 (mode = 145). For Part 2, questions 2-8 the average was 134 (mode = 135). 372 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 2020 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=161)	**Post-Test Average Points** (n=145)	**Point Change**	**Percent Change**
1. Defining a topic for the assignment	3.07	3.22	0.15	5%
2. Narrowing my topic	2.98	3.06	0.09	3%
3. Selecting search terms	3.11	3.35	0.24	8%
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.70	3.35	0.66	24%
5. Finding sources to use "out on the web" (example - Google, Wikipedia, websites)	3.71	3.66	-0.05	-1%
6. Determining whether a website is credible or not	3.23	3.43	0.20	6%
7. Figuring out where to find sources in different parts of the library	2.83	3.03	0.20	7%
8. Finding up-to-date materials	3.03	3.26	0.22	7%
9. Having to sort through all the irrelevant results I get to find what I need	2.80	3.14	0.34	12%
10. Evaluating the sources that I've found	3.08	3.50	0.42	14%
11. Reading and understanding the material	3.52	3.73	0.22	6%
12. Integrating different sources from my research into my assignment	3.24	3.56	0.32	10%
13. Knowing when I should cite a source	3.46	3.74	0.28	8%
14. Knowing how to cite a source in the right format	2.93	3.33	0.40	14%
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	3.09	3.46	0.36	12%
16. Knowing whether or not I've done a good job on the assignment	2.78	3.10	0.31	11%
Average	**3.10**	**3.37**	**0.27**	**9%**

Table 4. Percentage of responses at each level of difficulty for all questions in Part 1

Rating	**Pre-Test** (n=161)	**Post-Test** (n=145)	**Percent Change**
1 – This is very difficult	4%	2%	-46%
2 – This is difficult	24%	17%	-29%
3 – This is neutral	37%	36%	-4%
4 – This is easy	27%	31%	14%
5 – This is very easy	7%	14%	87%

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=149)	Post-Test (n=135)	Percent Change
2. Keywords	65%	66%	2%
4. Database	74%	90%	22%
6. Narrowing	67%	72%	7%
7. Sources	35%	50%	42%
8. Citation	77%	74%	-4%
Average	**63%**	**70%**	**11%**

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. Student responses were coded into up to three different categories.

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=148)
Other – "I hope to learn as much as I can due to the fact that not much was done involving this topic in my high school."	56
Finding resources – "I hope to learn how to find accurate and up-to-date information quickly and easily."	55
Library – "I hope to learn where specific sources are within the library."	55
Citation – "I also want to be able to source the right things and be correct while doing them."	23
Finding books – "I will like to learn how to get more fimilar with checking out books"	23
Evaluation of sources – "How to evaluate print sources."	22
Finding articles – "From the library session I hope to learn how to use data bases to find scholarly journals"	14
Topics – "I hope to learn how to narrow my topics as well as find some focus in my writing."	3
Web – "How to better use internet sources."	3
Interlibrary loan – "I hope to learn … what kind of access I have to interlibrary loans from other universities and institutes."	2
Nothing – "Nothing in particular"	2
Keywords – "What are the best ways to phrase the search terms when looking for information online."	1
Don't know – "I'm not sure what else I could learn honestly."	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=132)	**Post-Test Question 1.2 – "What do you wish that you would have learned?"**	**Number of Student Responses** (n=115)
Finding articles – "It was very helpful to learn about the ways to use the library research database. If I had gone into this project without that tool, I would have been very lost. "	61	**Nothing** – "I think I learned everything I would have wanted to learn."	31
Keywords – "I learned that you have to use specific search terms to get the results that you want for your topic."	23	**Citation** – "I wish I would have learned more about how to properly format citations."	25
Finding resources – "How to look for specific topic sources"	20	**Other** – "I wish I would have learned how to use the photocopy machine at the library."	14
Evaluation of sources – "The most useful thing that I learned was how to identify academic journals."	16	**Evaluation of sources** – "How to know if a source is credible"	9
Finding books – "How to find a book by using the online website."	11	**Finding books** – "I wish that we would have covered finding information in books"	7
Library – "It was useful to become more familiar with the Staley library website"	7	**Interlibrary loan** – "I wish we would have learned more about ILL and how long we can expect to wait for our sources. "	6
Nothing – "I don't think I really learned anything that I didn't already know."	7	**Library** – "I wish I would've learned more about the library itself rather than just the online library."	6
Topics – "she helped us narrow our topics down"	7	**Web** – "I wish we had talked more about finding journal articles on the 'open web'"	6
Other – "everything that I have been taught has been very helpful."	5	**Finding articles** – "Better skills at looking for articles"	5
Citation – "How to cite and not plagiarize"	4	**Finding resources** – "Go in more detail on how to search credible sources"	4
Interlibrary loan – "I learned how to use Illiad to order and receive online academic journals that cannot be found online."	4	**Topics** – "How to identify if a topic is too broad or too narrow."	4

Web – "I learned helpful information on how to search for online sources, using databases and websites."	2	**Don't know** – "I can't think of anything that I needed to know that wasn't covered by the librarian."	3
		Keywords – "I wish there would have been more practicing of narrowing down the search fields."	3

Table 8 and 9 (below) and Graph 3 (Appendix B) show the pre- and post-test scores for the two constructed response questions in Part 2 of the assessment.

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=146)	**Post-Test** (n=132)	**Point Change**	**Percent Change**
Average (out of 3)	**2.36 (79%)**	**2.26 (75%)**	**-0.10**	**-4%**

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=143)	**Post-Test** (n=130)	**Point Change**	**Percent Change**
Average (out of 3)	**1.72 (57%)**	**2.10 (70%)**	**0.38**	**22%**

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

Pre-Test Question 9 – "What are some research activities that librarians can help students with?"	**Number of Student Responses** (n=141)	**Post-Test Question 9 – "What are some research activities that librarians can help students with?"**	**Number of Student Responses** (n=126)
Finding books – "identifying appropriate books for a student's topic"	49	**Finding resources** – "They can help them find sources"	36
Finding resources – "Finding sources quicker and easier"	49	**Finding books** – "find the right book for your topic"	33
Finding articles – "What databases to look in for the most relevant information"	38	**Finding articles** – "Learning how to search through peer-reviewed journals for the necessary information."	32
Citation – "How to properly cite/reference sources in the paper to avoid plagiarism"	30	**Citation** – "Librarians can help ensure citations are correct."	31

Evaluation of sources – "They can also help us determine if a site is credible or not."	30	**Other** – "I think the activities that they provided us, got the job done"	26
Other – "Study tactics"	25	**Topics** – "advice students to build a better topic"	18
Library – "Finding the resources in the library."	18	**Evaluation of sources** – "Deciding if something is credible or not"	17
Web – "Try and find good websites to use"	14	**Keywords** – "They will help with search phrase"	15
Keywords – "They can help with picking new key words to help research."	8	**Library** – "Show us how to use the library"	10
Topics – "brainstorm research ideas"	7	**Nothing** – "Nothing, they were great!"	3
Don't know – "I actually have no clue."	6	**Web** – "Show them how to look up and identify credible sources on Google."	3
Interlibrary loan – "They can find specific books by specific authors and order them from separate libraries if necessary."	2	**Don't know** – "no idea."	2
Nothing – "none"	1	**Interlibrary loan** – " They can help students locate and order scholarly journals that cannot be accessed online "	1

Table 11. Student scores on the virtual tour worksheet

Average Score (out of 10) (n=296)	9.3
Average Mean (out of 10) (n=296)	9.5

Table 12. Virtual tour survey results

	Number of Student Responses	**Percentage of Student Responses**
How helpful did you find the virtual tour? (n=25)		
5 – I learned a lot!	11	44%
4	8	32%
3	4	16%
2	2	8%
1 – I learned very little	0	0%

How helpful did you find the two videos? (n=25)		
5 – I learned a lot!	7	29%
4	11	46%
3	3	13%
2	3	13%
1 – I learned very little	1	4%
Now that you have completed the tour, do you feel more comfortable using Staley Library? (n=25)		
Yes	23	92%
No	1	4%
Not sure	1	4%
Do you feel more confident about finding library resources? (n=25)		
Yes	21	84%
No	1	4%
Not sure	3	12%
Do you know who to ask for help in the library? (n=25)		
Yes	25	100%
No	0	0%
Not sure	0	0%

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 0.27 points or 9%. As in past years, students showed the most improved confidence in finding articles in the library databases and knowing how to cite sources. Students also expressed increased confidence in their ability to evaluate sources, which, in the past, has not been an area of particular growth. Students showed an average 11% increase in correct answers on the multiple choice portion of Part 2 and an average .14 point or 9% increase in correct answers on the short answer questions.[4]

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 at the top end of the Adequate (Yellow) range of the scale (short answer = 73%). Overall, the percentage of correct answers on the multiple choice portion of Part 2 of the post-test also fell in the yellow range (multiple choice = 70%), but there was a wide disparity in the percentage of correct responses. Question 4 (databases) was well in the green range (90%), while question 2 (keywords) was in the low yellow range (66%) and question 7 (sources) was in the red range

[4] Another measure of the students' progress from the pre- to the post-test is to look at the *average normalized gain*, which is a measure commonly used in physics education for pre- and post-test assessments, (e.g., Hake, A. (1997). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for an introductory physics course. *American Journal of Physics, 66*(1), 64-74). Average normalized gain <g> is the average actual gain (%post – %pre) divided by the maximum possible average gain (100% – %pre). High-g courses, i.e., those with a large gain from the pre- to the post-test, are those where $g \geq 0.7$, medium-g courses are those where $0.7 > g \geq 0.3$, and low-g courses are those where $g < 0.3$. When applied to this years' assessment, for the selected response questions $g = .19$ and for the constructed response questions $g = .14$, i.e., both low-g.

(50%). With the exception of question 6 (narrowing), all of the multiple choice post-test scores were lower than academic year 2016-2017 and the overall percentage change from the pre- to the post-test was lower as well (11% increase this year versus 15% last year). As in past years, the students showed the greatest increase in their scores on questions related to material that the librarians particularly emphasize in their instruction sessions, e.g., scholarly databases and peer-reviewed journal articles (questions 4, 5, and 7). On the whole this year's assessment shows that students' information literacy confidence and abilities are 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), as has been the case in past years.

Analysis of Assessment Results for Part 1

Students' self-assessed confidence increased on a majority of the questions in Part 1 and on the whole increased by .27 points (9%). The greatest increase in confidence was in finding articles in the library databases (question 4), evaluating sources (#10), knowing how to cite sources in the correct format (#14), knowing what constitutes plagiarism (#15), and sorting through sources to find what the student needs (#9). Using the library databases is covered extensively in library instruction sessions and these results reflect positively on that instruction. The increased confidence in evaluating sources is also encouraging, although determining credibility of a website, which is discussed extensively in the fall semester, only showed a 6% (.20 point) increase. Sorting through irrelevant results is another topic that is covered in library sessions, particularly in CWRR II. Citing sources and plagiarism are covered in varying degrees both in library instruction and by Seminar/CWRR faculty.

Students confidence is finding sources "out on the web" decreased slightly from the pre- to the post-test, although their confidence on the pre-test (3.71) was the highest out of all of the questions. Students also demonstrated only modest gains in their confidence in narrowing a topic (3%) and defining a topic (5%). However, students did indicate that they were 11% more confident in knowing when they had done a good job on an assignment, which is an unusual result, since in past year students have shown a decrease in confidence in this area.

Table 4 (above) lists the percentage of responses at 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, with most responses falling into the neutral or easy categories by the time of the post-test. 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%) in their scores between the pre- and post-tests, which is the same as what we saw last year. While the pre-test score was relatively high (65%) it would be nice to see a greater increase in correct reponses by the post-test, especially because the post-test scores have been higher in the past. Identifying keywords is covered in library instruction both in the fall and the spring, and it is an important skill for students so that they can search effectively in library databases and on the open web.

Question 4 on the types of resources available in library databases showed a significant improvement (22%) between the two tests; 90% of students correctly identified library databases as a source for journal articles 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 almost half of them mentioned in question 1 of the post-test that learning to use the databases was the most important thing that they learned) is an indicator of the importance of library instruction.

Question 6 asks students to narrow a given topic. While the scores were higher than in the previous year, they were still not high enough to make it into the Excellent (Green) range. Interestingly, students expressed the second lowest confidence rate on the post-test (3.06) in their ability to narrow a topic, which seems to indicate that while a majority may be able to perform this task, their confidence in doing so is low. All of this seems to suggest that topic narrowing (and the associated skill of narrowing a search) are skills that the librarians should highlight in their instruction.

Question 7 showed the largest increase in the number of correct answers from the pre- to the post-test (42%), but had the lowest score on the post-test (only 50% correct). This question asks students to identify a non-biased 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, for the second year in a row 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, this concept is introduced by librarians in all the CWRR II classes and should be familiar to students by the end of their first year. Nonetheless, by the post-test 33% of the 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 decrease (-4%) in the number of correct responses from pre- to post-test. As in the past, students' scores were high for this question and the difference from the pre- to the post-test is typically small, but the overall scores were lower on both the pre- and the post-test than last year (80% last year vs. 77% this year on the pre-test and 84% last year vs. 74% this year on the post-test). As mentioned above, discussion of citations and plagiarism is taught by both the librarians and the Seminar/CWRR faculty, and it is covered more or less intensively depending on the section and the instructor. If this question continues to show declining scores, perhaps the librarians should make a point to discuss citations and their importance in avoiding plagiarism in our instruction more directly.

Short Answer Questions

Question 1 in the pre-test provides important insights into students' 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 finding resources ("I hope to learn how to more efficiently find reliable sources to help me complete my assignment with more ease and in less time than before"), incorporating research into the writing process ("How to use the information that I have gathered in an effective way"), and the library overall ("I hope to learn more about the benefits of using a library and why they are still relevant today"). A few students also expressed an interest in learning more about the new University Commons ("When the new library will be finished").

By the time of the post-test, students had a more defined conception of what the library and librarians can offer them as researchers. As in past years, a majority of students identified finding articles/using the databases as the most valuable thing that they learned in their library instruction ("The most useful thing that I learned from his library sessions was how to find and use the online databases through Millikin to find credible articles and find the books I needed with useful information using Millikin's library"). Students also identified formulating keywords and finding resources as important skill that they learned in the sessions ("Learning how to get credible information and research for my projects").

For post-test question 1.2, which asks what they wish they had learned, a majority of students claimed that they learned everything that they wanted to learn. While it may be flattering to think that we have taught them everything that they need to know about information literacy in three to four class sessions, this is clearly not true, but may indicate their satisfaction with the sessions. The second most popular response was citations, which has historically been a topic that students want to learn more about. The third most popular response, "other," usually dealt with the writing process and incorporating sources into a paper ("I wish I could have learned more about how to incorporate my outside research and sources into my papers"). Six students indicated that they wanted to learn more about the library itself ("I wish I would have learned how to fully use the physical Library. Perhaps a field trip?"). These were very telling responses that indicate that "library as place" remains important to students. The librarians realized that the virtual library tour was a compromise necessitated by the limitations of our temporary location. We plan on offering in-person tours in the University Commons in the fall to acclimate students to our new location.

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 where students develop criteria for evaluating websites. Students showed a 4% *decrease* in their average score from pre- to post-test for this question. The high initial scores on this question (2.36 out of 3) indicate that students are probably receiving some instruction on website evaluation before entering college. However, their pre-test 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. Many of the responses also mentioned that websites where users can edit the content (e.g., Wikipedia) are not reliable, which again is a very black or white way of understanding websites. 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. What is puzzling is the decrease in scores from the pre- to the post-test. While not substantial (-.1 points), it is discouraging to see that students' scores did not improve in an area that is explicitly covered in library instruction. A perennial problem with this question is that students tend to be very terse in their responses, e.g., "Web address, Contributers {sic}, Date," which makes scoring the results very difficult since it is not clear how students think one should apply these criteria when evaluating a website.

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 22% to 2.10 out of 3 (70% correct). These results do 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, however, the scores on both the pre- and post-test tests were substantially lower than last year (70% correct on the post-test this year versus 91% correct last year). As with question #3, the students' answers tended to be very brief and often vague, e.g., "They are very accurate, are written by well-honorable writers, contain scholarly information." Another interesting element is that students generally had a very dim view of magazines, especially on the pre-test, e.g., "magazines display outrageous facts that sometimes aren't true just so that they can get a headline." Very few responses gave examples of magazines, and it would be interesting to find out which magazines the students have in mind, since many magazines provide serious, detailed reporting that is intended for a general audience.

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. On the pre-test students identified traditional activities with librarians, e.g., finding books and other resources, but by the time of the post-test the responses were more varied and included finding credible resources, finding books and articles, helping with citations, and other activities such as "[l]ibrarians can provide research strategies to make the instructions attainable to the students." The variety of activities that students identified, especially in the post-test, is noteworthy and demonstrates that students recognize the different ways that librarians can help them with the research process.

Analysis of Results for the Virtual Library Tour

This fall 296 students completed the 10 questions worksheet associated with the virtual tour of the library in its temporary location. The average score was 9.3 with a mean of 9.5 (see Table 11 above). Based on a class of 465 students, that means that 65% of the enrolled students completed the tour. While the scores on the worksheet continued to be high, the participation rate dropped significantly from the previous year, when approximately 80% of students completed the self-guided tour. While the librarians wanted to continue to offer a form of orientation to the physical library while in New Hall 3, we knew that the virtual tour would be a compromise. We intend to return to physical tours of the library in the University Commons, beginning with guided tours in fall 2017 and returning to a self-guided tour in subsequent years.

The number of participants in the post-worksheet survey also dropped from 110 last year to 25 this year, which represents only 8% of those who completed the worksheet. Nonetheless, a majority of respondents claimed to have learned a lot from the tour and a majority scored the two videos a 4 or 5 (on a 5 point scale) for helpfulness (see Table 12 above for the survey results). A majority of students also claimed that the virtual tour met the learning goals of making students feel more comfortable in the library (92%), more confident using library resources (84%), and more knowledgeable about who to ask for help in the library (100%). 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.

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

This year data were collected from only one PACE CWRR classes (a CWRR II class) and two off-sequence CWRR II sections. In all cases the number of participants was small. Collecting reliable data from these classes is challenging for a number of reasons. Not all PACE students who take 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, so some of the students are taking CWRR II for a second time and some have not taken CWRR I. Finally, the brief PACE semester sometimes makes scheduling the pre- and post-test challenging if not impossible. This past year, these difficulties were compounded by changes in the coding of PACE classes in Banner. Now all of the students are lumped together in one large Moodle "course" and there is no easy way to separate the data for the PACE students from the traditional students. In the fall semester, the Instruction Coordinator recreated the assessment in a Google Form and this is what was given to the PACE CWRR II class and two students responded. In the spring semester PACE CWRR I was only offered in an online format and CWRR II was not offered at all. After consulting with the course instructor, the Instruction Coordinator decided to offer online instruction to the CWRR I students using tutorials in the LibGuides platform and to follow up with a worksheet to test the students' comprehension. Only two students out of a class of 9 completed the worksheet. Given the changed scheduling and evolving delivery method of the PACE CWRR classes it may be necessary to re-think the instruction and assessment in these classes.

Due to the small number of respondents and the other difficulties mentioned above, the reliability of the results from the PACE and off-sequence classes are clearly in question. The two students who responded to the PACE assessment demonstrated a higher confidence in their research abilities than the traditional

students (4.0 versus 3.37). The only areas in which students showed lower confidence was in defining a topic, selecting search terms, and knowing when to cite a source. Their scores for the multiple choice questions were overall lower (60% versus 70%), although they scored 100% on three of the questions. The students scored 83% correct (2.5 out of 3) on the both the short answer questions (#s 3 & 5). The students' responses for questions 1 and 9 were similar to the traditional students. They identified finding resources as the most important thing they learned and they said that they would have like to learn more about citations. All of the results for the PACE CWRR II class can be found in Appendix C below.

Only 10 of the 37 students in the off-sequence CWRR II class completed the assessment. These students showed a higher overall confidence in the research process compared to the traditional students (3.71 versus 3.37). They expressed the greatest confidence in reading and understanding material and in knowing when use of a source constitutes plagiarism. They had the lowest confidence in defining a topic and finding sources in different parts of the library. The students' scores for the multiple choice questions in Part 2 of the assessment were lower overall than the traditional students (64% versus 70%) although the questions with the highest and lowest scores corresponded with the performance of the traditional students, i.e., the highest score on knowing what resources are in library databases, and the lowest scores on keyword and narrowing, although the off-sequence students did better on the question asking about credible sources of information (question 7). The students did slightly better on the open ended questions (#s 3 & 5) than the traditional students (79% correct versus 73% correct). The responses to question 1 were also very similar, although more students expressed an interest in learning about evaluation of sources than traditional students. Finally, on question 9 most of the students identified finding articles as one of the most important activities that librarians can help students with. Overall, despite the challenges that the off-sequence sections provide to the pre- and post-test assessment format as explained above, it continues to be interesting to see the results for the off-sequence sections, especially their responses to questions 1 & 9.

Improvement Plan

An ongoing challenge with the library assessment is the lack of participation. This year, only 35% of the students enrolled in CWRR I participated in the pre-test and only 39% of the students enrolled in CWRR II participated in the post-test. Typically the participation in the pre-test is higher than in the post-test, but this year the reverse was true. This may, in part, explain why some of the scores did not show as large an increase as in past years. While it is possible to make comparisons across the two tests, these low participation rates do challenge 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 sampling of the class of 2020. For example, the participation rate may be higher from the honors sections of CWRR, which would certainly skew the results. The advantage of this method 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 continues 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 changes in the scheduling and University coding of PACE classes made it especially difficult. Also, if these classes continue the move online, this may necessitate changes to the information literacy instruction and the associated assessment for these classes. The Instruction Coordinator will work with the other librarians and the CWRR coordinator to address these issues.

Based on the limited results from the student survey it appears that the virtual tour of the library's temporary space in New Hall 3 met the learning outcomes of the library tour, but the participation rate was lower than the previous year. As mentioned above, the librarians intend to provide in-person tours of the new University Commons in the fall, and in the future the tour will probably return to a self-guided format.

This assessment report continued the practice of having multiple people code/grade the constructed response questions in Part 2. This year librarian Rachel Bicicchi worked with Matthew Olsen. Before doing the grading/coding they held a norming session and then worked with the questions independently. The scores of questions 3 and 5 were averaged[5] and for questions 1 and 9 any disagreements in the coding of questions were discussed and a common coding established. 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 continues to be successful and will be maintained in the future.

Based on the results of the assessment, it seems that several of the questions in Part 2 could be revised. This year a number of students misunderstood question 9 – "What are some research activities that librarians can help students with?" – as asking about in-class activities, rather than how librarians can help students with their research overall. The Instruction Coordinator will work with the other librarians to establish clearer wording for this questions. Questions 3 and 5 in Part 2 continue to receive frustratingly brief responses. Perhaps changing the wording in questions 3 from asking students to "list three criteria" to "describe three criteria" (as question 5 is worded) may help. Question 7 on credible source types typically receives some of the lowest scores of the assessment. Because the ordering of the possible answers for the multiple choice questions is fixed and the correct response is the last response, it may be worthwhile to experiment with reordering the possible answers to see if affects the scores.

While students tend to perform well on those parts of the assessment that correspond to areas most directly covered in our instruction sessions, e.g., the purpose and mechanics of library databases, the poor scores on the keyword question (Part 2, question 2) is discouraging and indicates that greater emphasis may need to be placed on formulating keywords for use in search engines and databases. Students also struggled with more complex topics like source credibility and bias and to a lesser extent narrowing topics. These are complex concepts that are difficult to fully address in just a few instruction sessions. Last year the librarians began working with the Association of College & Research Libraries' *Framework for Information Literacy for Higher Education*,[6] which is a new guiding document for information literacy instruction in higher education. This document, which was formally adopted by the ACRL in January 2016, introduces a more conceptual approach to information literacy instruction through the use of "threshold concepts." We are continuing to develop revised learning outcomes and instruction activities with the hope that they help to address some of the higher order skills that we would like to instill in our students.

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 throughout 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 advanced 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 2017-2018 academic year.

[5] The standard deviation between the two coders was low, 0.23 for Question 3 and 0.13 for Question 5.
[6] Association of College and Research Libraries. (2016). *Framework for Information Literacy for Higher Education*. Retrieved from the ACRL website: http://www.ala.org/acrl/standards/ilframework

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?

1. (Post-Test) This year, a librarian visited your CWRR and Seminar 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 to write a research paper on a current events issue and you have decided to write about privacy on the Internet. Your professor tells you that your topic is too general. Of the following, which is the best way to **narrow** your Internet privacy topic?
   Focus on the relationship of Facebook use and self-esteem.
   Focus on methods that schools are using to prevent online bullying.
   Focus on social media companies and how they use personal data to make money.
   Focus on whether e-books affect student learning.

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 sources (author, title, date, etc.), so that you can cite them properly?
   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 you are working on your reference list.
   When the teacher asks you for proof that you did not plagiarize the information in the paper.

9. What are some research activities that librarians can help students with?

Categories for Part 2, Questions 1 & 9

A = Finding articles (also using databases)

B = Finding books (and other print materials, also using the catalog)

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 "databases"]

T = Topics – defining, narrowing, etc.

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

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

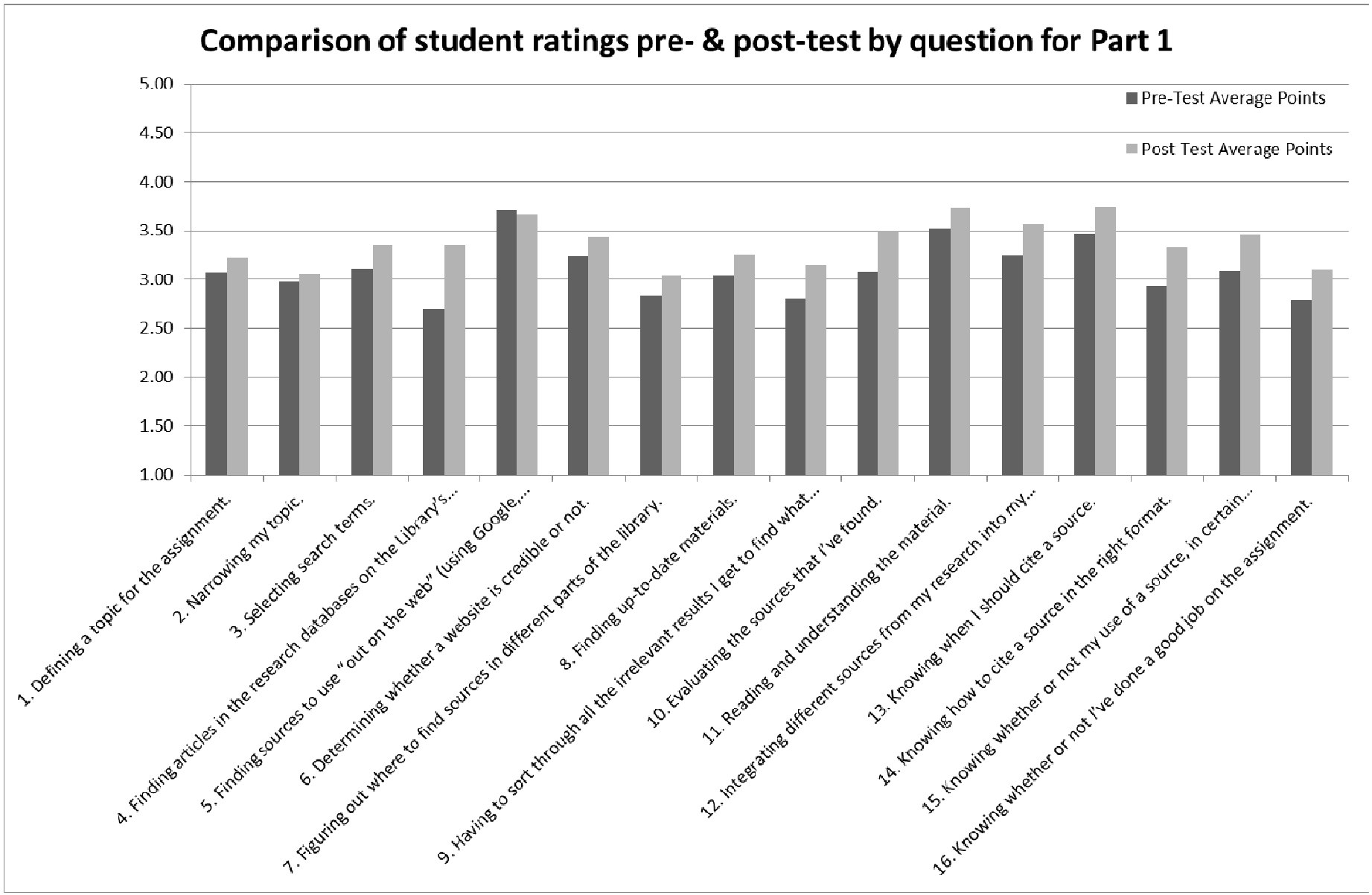
2 = Two differences correctly identified

3 = Three differences correctly identified

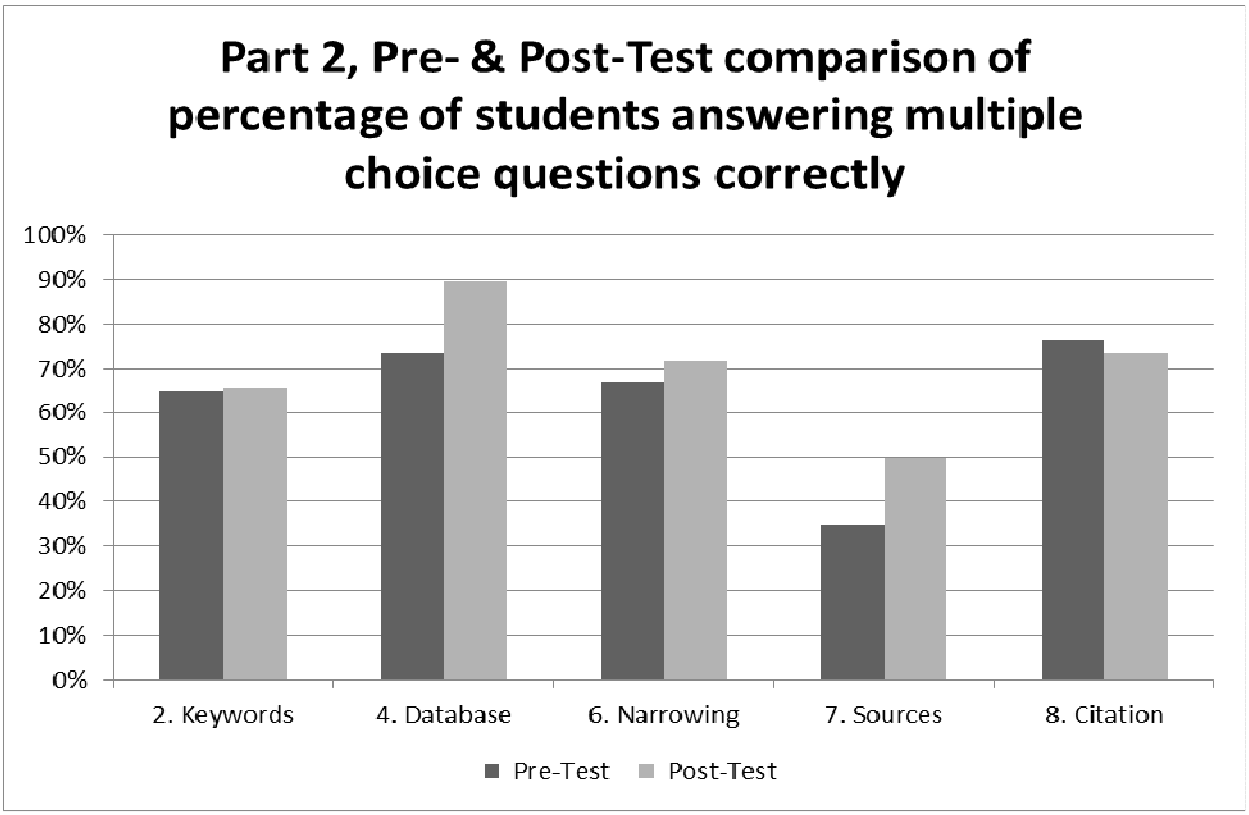
Appendix B

Graphical Representation of Pre- and Post-Test Results

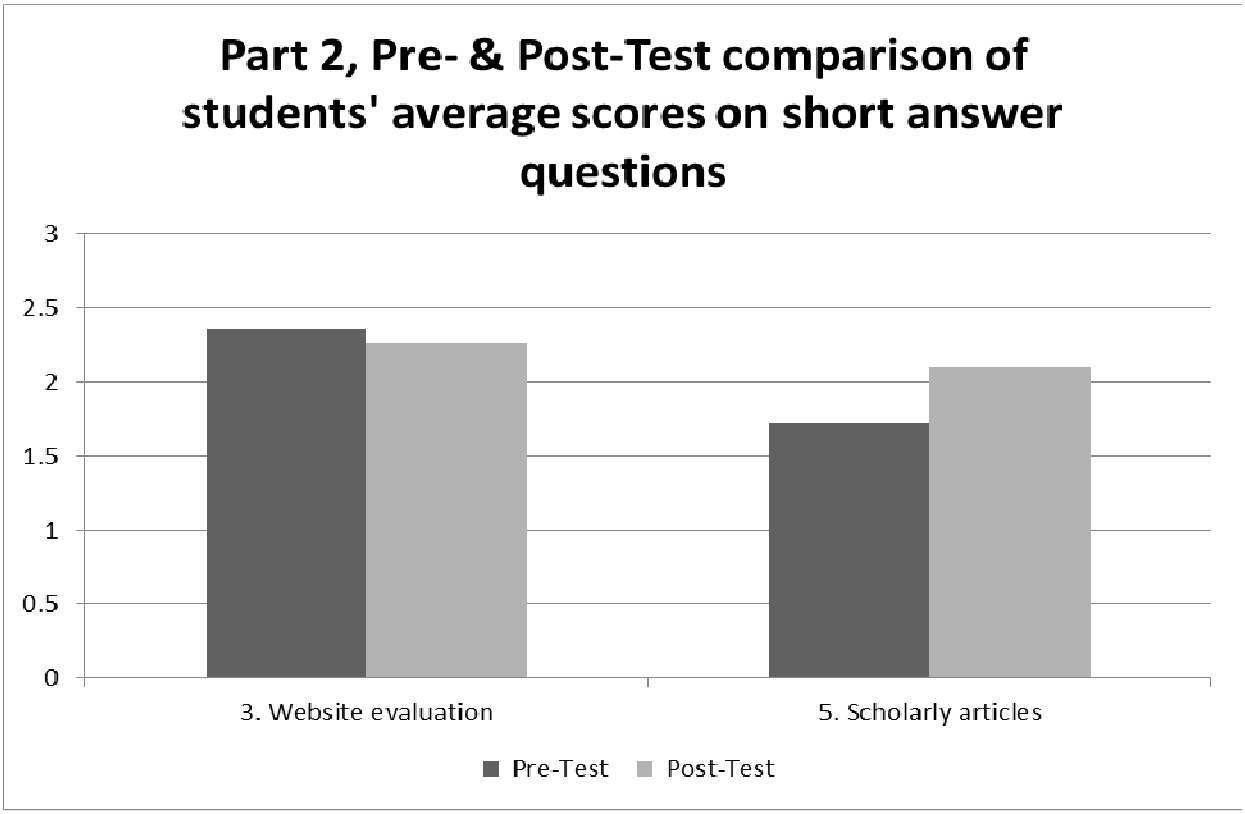
Graph 1


Comparison of student ratings pre- & post-test by question for Part 1
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
Pre-Test Average Points
Post Test Average Points
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 library.
8. Finding up-to-date materials.
9. Having to sort through all the irrelevant results I get to find what...
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 assignment.

Graph 2



Graph 3



Appendix C

PACE CWRR Results[7]

Part 1

Table C.1. Student ratings by question for Part 1

Question **Scale 1 - 5** **1 = very difficult** **5 = very easy**	**Post-Test Average Points** (n=2)
1. Defining a topic for the assignment	3.50
2. Narrowing my topic	4.00
3. Selecting search terms	3.50
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	4.00
5. Finding sources to use "out on the web" (using Google, Wikipedia, or other search sites)	4.00
6. Determining whether a website is credible or not	4.00
7. Figuring out where to find sources in different parts of the library	4.50
8. Finding up-to-date materials	4.50
9. Having to sort through all the irrelevant results I get to find what I need	4.00
10. Evaluating the sources that I've found	4.00
11. Reading and understanding the material	4.00
12. Integrating different sources from my research into my assignment	4.00
13. Knowing when I should cite a source	3.50
14. Knowing how to cite a source in the right format	4.00
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	4.50
16. Knowing whether or not I've done a good job on the assignment	4.00
Average	**4.00**

Table C.2. Percentage of responses at each level of difficulty for all questions in Part 1

Rating	**Post-Test** (n=2)
1 – This is very difficult	0%
2 – This is difficult	9%
3 – This is neutral	31%
4 – This is easy	9%
5 – This is very easy	50%

[7] The PACE CWRR results are from one post-test from a CWRR II class in the fall semester.

Part 2

Table C.3. Percentage of students answering each multiple choice question correctly

Multiple Choice Question	**Post-Test** (n=2)
2. Keywords	0%
4. Database	100%
5. Narrowing	100%
7. Sources	0%
8. Citation	100%
Average	**60%**

Table C.4. 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(s)?	**Number of Student Responses** (n=1)	**Post-Test Question 1.2 - What do you wish that you would have learned?**	**Number of Student Responses** (n=1)
Finding resources – "I learned how to research my topic involving media and how to narrow down the results."	1	**Citation** – "I wish we could have done an example of APA citation."	1
Evaluating sources – "I learned how to research my topic involving media and how to narrow down the results."	1		

Table C.5. Students' post-test scores 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."	**Post-Test** (n=2)
Average (out of 3)	**2.50 (83%)**

Table C.6. Students' post-test scores for question 5

Question 5 – "Describe three ways that scholarly journal articles differ from magazine articles or newspaper articles."	**Post-Test** (n=2)
Average (out of 3)	**2.50 (83%)**

Table C.7. Coded student responses to post-test question 9

Post-Test Question 9 – "What are some research activities that librarians can help students with?"	**Number of Student Responses** (n=2)
Evaluation of sources – "What authors are most credible."	1
Topics - "narrow down topics to research"	1

Appendix D

Off-Sequence CWRR Results[8]

Part 1

Table D.1. Student ratings by question for Part 1

Question **Scale 1 - 5** **1 = very difficult** **5 = very easy**	**Post-Test Average Points** (n=10)
1. Defining a topic for the assignment	3.20
2. Narrowing my topic	3.60
3. Selecting search terms	3.90
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	3.60
5. Finding sources to use "out on the web" (using Google, Wikipedia, or other search sites)	3.80
6. Determining whether a website is credible or not	3.60
7. Figuring out where to find sources in different parts of the library	3.40
8. Finding up-to-date materials	3.60
9. Having to sort through all the irrelevant results I get to find what I need	3.90
10. Evaluating the sources that I've found	3.90
11. Reading and understanding the material	4.00
12. Integrating different sources from my research into my assignment	3.80
13. Knowing when I should cite a source	3.80
14. Knowing how to cite a source in the right format	3.70
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	4.00
16. Knowing whether or not I've done a good job on the assignment	3.60
Average	**3.71**

[8] The off-sequence results are from two sections of CWRR II in fall 2016.

Table D.2. Percentage of responses at each level of difficulty for all questions in Part 1

Rating	Post-Test (n=10)
1 – This is very difficult	0%
2 – This is difficult	10%
3 – This is neutral	26%
4 – This is easy	46%
5 – This is very easy	18%

Part 2

Table D.3. Percentage of students answering each multiple choice question correctly

Multiple Choice Question	Post-Test (n=10)
2. Keywords	50%
4. Database	80%
5. Narrowing	50%
7. Sources	70%
8. Citation	70%
Average	**64%**

Table D.4. 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(s)?	Number of Student Responses (n=10)	Post-Test Question 1.2 - What do you wish that you would have learned?	Number of Student Responses (n=9)
Finding articles – "Showed how to use the library database."	3	**Evaluation of sources** – " How to better determine if a source is credible"	2
Keyword – "How to narrow my searches down to a specific."	2	**Nothing** – "Nothing, very useful information"	2
Finding resources – "The most useful thing I learned from the library session were the different types of sources related to your topic."	2	**Don't know** – "Not sure"	1
Citation –"I learned how to properly cite a website"	1	**Keywords** – "I wish I would have learned how to enter in the right key words for the library search."	1
Nothing – "I was already knowledgeable of the information the librarian shared because of the same presentation given during CWRR 1."	1	**Library** – "To properly know how to use the library section on millikin.edu"	1

Other – "The differences between materials that can be useful to me and which would be the most."	1	**Other –** "I wish I learned how to insert a header"	1
Topics – "How to effectively choose, narrow down, and search a topic."	1	**Finding resources** – "I wish i could have learned how to find recent information."	1

Table D.5. Students' post-test scores 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."	**Post-Test** (n=17)
Average (out of 3)	**2.40 (80%)**

Table D.6. Students' post-test scores for question 5

Question 5 – "Describe three ways that scholarly journal articles differ from magazine articles or newspaper articles."	**Post-Test** (n=10)
Average (out of 3)	**2.35 (78%)**

Table D.7. Coded student responses to post-test question 9

Post-Test Question 9 – "What are some research activities that librarians can help students with?"	**Number of Student Responses** (n=10)
Finding articles – "Help with accessing journals that may be harder for us to find"	3
Finding books – "Librarians could help inform the students on how to find books that interest them."	2
Other – "Have the class pick from a list of proper and improper sources"	2
Finding resources – "finding relevant information to your topic"	2
Topics – "narrowing a topic"	2
Citation – "Teaching how to properly cite."	1
Evaluation of sources – "Have the class pick from a list of proper and improper sources"	1
Interlibrary loan – "How to look up certain books in other libraries."	1
Keyword – "choosing search words"	1