

Student Learning in Library Research Instruction for University Seminar, Critical Writing, Reading, and Research I & II, and Honors Writing Studio 1 & 2

Assessment Report for Academic Year 2018-2019

Reported by Matthew Olsen, Instructional Services Coordinator
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Summary

During the 2018-2019 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 learning goals.

All students enrolled in the University Seminar/CWRR/HWS sequence (essentially all first-year students at Millikin University) were included in the assessment. While participation varied by question, approximately 217 students took the pre-test and approximately 148 students took the post-test.

Key findings from the assessment include:

- Students showed an overall increase in their confidence with the research process and in their information literacy skills from the pre-test to the post-test assessment. On average, the scores on the skills part of the assessment were in the Green range on the CWRR Artifact Performance Indicator Scale.
- Students' confidence and skills in the research process increased for all 4 of Staley Library's learning goals, especially "identifying information sources" and "evaluating information."
- Students' confidence finding articles in library databases and knowing how to cite a source increased the most from the pre-test to the post-test, while their confidence narrowing and defining a topic increased the least. Students' were the most confident about finding information on the internet for both the pre- and the post-test.
- The greatest increases in students' information literacy skills were in identifying non-biased sources of information and knowing what type of information sources can be found in library databases. Students showed the smallest increases in their ability to know when to cite a source and identifying criteria for evaluating a website, although the absolute scores in both of these areas were among the highest.
- Scores for this year's assessment were comparable to an average of the previous five years. On Part 1 (research confidence) they were very similar (3.34 vs. 3.33), in Part 2 (information literacy skills) for the multiple choice questions they were slightly lower (72% vs. 74% correct answers) and for the open-ended questions they were higher (2.63 vs. 2.49).
- Based on their comments, students appreciate library instruction, especially learning how to find scholarly articles. Their comments also showed that they would like to learn even more about citations and how to efficiently find up-to-date sources and how to incorporate those sources into their writing.
- The self-guided library tour showed strong participation, high scores on the associated worksheet, and almost all of those students who completed the optional survey at the end of the tour indicated that it met its stated learning goals.

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 are able to apply critical thinking skills in the discovery, 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 who are prepared to critically and ethically use information throughout their lives.

The research instruction program corresponds directly with CWRR and HWS learning outcome goal 3: “Conduct research to participate in academic inquiry.” The purpose of research instruction for CWRR and HWS is stated in Staley Library’s four 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

Staley Library faculty devote a majority of their in-class instructional activity to the first-year core courses – CWRR, HWS, 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 can be taught in either University Seminar or CWRR/HWS as best matches the needs of the instructors, but usually one session is taught in each of the classes; the two spring sessions are both taught in CWRR/HWS as there is no spring University 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 University Seminar and CWRR/HWS faculty to schedule the library session(s) appropriately

so that students are able to learn and apply skills in a way that makes them immediately relevant to their research needs.

During the 2018-2019 academic year, the librarians taught 66 sessions (in 51 sections) for CWRR and HWS classes, 25 sessions (in 25 sections) for University Seminar classes, and 7 sessions (in 4 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).

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

The Learning Story

For most Millikin University students, CWRR/HWS 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/HWS 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 apply the skills that they are learning.

Assessment Methods

Pre- and Post-Test Assessment Methods

The 2018-2019 academic year marks the thirteenth 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. Question 1 on the post-test has two parts: “What was the most useful thing that you learned from the library sessions?” and “What do you wish that you would have learned?” Question 9 is another short answer question that asks the students how librarians can help with the

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

research process; it is intended to gauge how students perceive the role of the librarian. The complete list of questions can be found in Appendix A.

To facilitate reporting of the range of answers to the short answer questions, responses to question 1 and 9 were coded into fourteen categories, all of which are listed in Appendix A. Each response was assigned up to three codes. The Instruction Coordinator and Amanda Pippitt performed the coding. 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, 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 library’s resources and services that are available in the University Commons. 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.

After one year of guided tours to familiarize students and faculty with the University Commons, in fall 2018 we returned to the self-guided tour format that we have used in the past. The self-guided tour uses a mystery ‘narrative’ format that incorporated a worksheet and QR (Quick Response) codes scanned with a smartphone that guided students around the library. Students were directed to places like the Research Assistance Desk, New Technologies Studio, University Archives, and the books stacks for a total of ten locations. The only non-library space in the University Commons that students visited on the tour was the Writing Center. At each location students answered a brief question on a worksheet and received a clue that led them to the next 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 2018-2019 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 their library instruction. To view the survey questions please contact the Instruction Coordinator.

Assessment Data

Fall Pre-Test²

Part 1: Average score = 3.12 (5 point scale)

Part 2: Multiple choice: Average percentage of students answering the question correctly = 63%

Short answer: Average score = 2.46 (3 point scale)

Spring Post-Test³

Part 1: Average score = 3.34 (5 point scale)

Part 2: Multiple choice: Average percentage of students answering the questions correctly = 72%

Short answer: Average score = 2.63 (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
<p>Part 1 Questions 7 & 8 Pre-Test Avg. = 2.8 Post-Test Avg. = 3.1 Improvement = 9%</p> <p>Part 2 Questions 4 & 5 Pre-Test Avg. = 74% Post-Test Avg. = 85% Improvement = 14%</p> <p>Total for LG 1 Improvement = 11%</p>	<p>Part 1 Questions 1, 2, 3, 4 & 5 Pre-Test Avg. = 3.1 Post-Test Avg. = 3.3 Improvement = 6%</p> <p>Part 2 Question 2 & 6 Pre-Test Avg. = 64% Post-Test Avg. = 70% Improvement = 9%</p> <p>Total for LG 2 Improvement = 7%</p>	<p>Part 1 Questions 6, 9 & 10 Pre-Test Avg. = 3.2 Post-Test Avg. = 3.4 Improvement = 6%</p> <p>Part 2 Questions 3 & 7 Pre-Test Avg. = 64% Post-Test Avg. = 74% Improvement = 15%</p> <p>Total for LG 3 Improvement = 10%</p>	<p>Part 1 Questions 13, 14 & 15 Pre-Test Avg. = 3.3 Post-Test Avg. = 3.5 Improvement = 7%</p> <p>Part 2 Question 8 Pre-Test Avg. = 75% Post-Test Avg. = 79% Improvement = 6%</p> <p>Total for LG 4 Improvement = 6%</p>

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 228 (mode = 228). For Part 2, questions 2-8 the average was 206 (mode = 207). 483 students were enrolled in IN150 and HN150.

³ The post-test also exhibited different numbers of responses from question to question. For Part 1 the average number of responses was 151 (mode = 151). For Part 2, questions 2-8 the average was 144 (mode = 145). 424 students were enrolled in IN151 and HN151. The participation rates in the pre- and post-test and their relation to the size of the 2023 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=228)	Post-Test Average Points (n=151)	Point Change	Percent Change
1. Defining a topic for the assignment	3.02	3.11	0.08	3%
2. Narrowing my topic	3.01	3.08	0.07	2%
3. Selecting search terms	3.12	3.38	0.25	8%
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.71	3.03	0.32	12%
5. Finding sources to use "out on the web" (example - Google, Wikipedia, websites)	3.55	3.76	0.21	6%
6. Determining whether a website is credible or not	3.32	3.52	0.20	6%
7. Figuring out where to find sources in different parts of the library	2.70	3.01	0.31	11%
8. Finding up-to-date materials	2.96	3.15	0.18	6%
9. Having to sort through all the irrelevant results I get to find what I need	2.96	3.05	0.09	3%
10. Evaluating the sources that I've found	3.26	3.52	0.26	8%
11. Reading and understanding the material	3.50	3.74	0.24	7%
12. Integrating different sources from my research into my assignment	3.24	3.57	0.33	10%
13. Knowing when I should cite a source	3.54	3.65	0.11	3%
14. Knowing how to cite a source in the right format	3.06	3.45	0.39	13%
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	3.19	3.39	0.20	6%
16. Knowing whether or not I've done a good job on the assignment	2.82	3.05	0.23	8%
Average	3.12	3.34	0.22	7%

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

Rating	Pre-Test (n=228)	Post-Test (n=151)	Percent Change
1 - This is very difficult	4%	3%	-26%
2 - This is difficult	23%	17%	-26%
3 - This is neutral	37%	34%	-9%
4 - This is easy	28%	35%	24%
5 - This is very easy	8%	11%	45%

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=207)	Post-Test (n=145)	Percent Change
2. Keywords	59%	66%	11%
4. Database	68%	82%	20%
6. Narrowing	69%	74%	8%
7. Sources	44%	59%	34%
8. Citation	75%	79%	6%
Average	63%	72%	14%

Tables 6, 7, and 10 (below) list the number of student responses that matched a given category for questions 1 and 9 and provide 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?"	Number of Student Responses (n=207)
Finding Resources - "I hope to learn more about how to find credible sources"	93
Other - "How to utilize my Millikin resources with ease as a freshman here."	73
Library - "I am hoping to learn about where sources are in the library and get a tour."	54
Citation - "I'd like more information about citations."	37
Finding articles - "how to find articles better"	26
Evaluation of sources - "I hope how to decipher between credible and incredible sources for projects and essays more efficiently."	23
Writing papers - "I hope to learn how to better organize my essay's."	19
Finding books - "Where to find all the books I would need to have for my research."	18
Topics - "how to narrow my topics more efficiently"	4
Nothing - "Hopefully to expand the knowledge I already possess from high school. We had library talks at the very beginning of each semester all four years going over the same stuff like how to validate a website for credibility, how to cite different sources, etc... so I think i'll know most of the information presented but maybe I'll here something new to apply to my work. "	3
Web - "How to find the best research websites to use."	3

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=142)	Post-Test Question 1.2 - "What do you wish that you would have learned?"	Number of Student Responses (n=130)
Finding articles - "Just how to work the databases and how to use them efficiently."	66	Nothing - "Nothing really because we always have the help desk"	31
Finding resources - "The librarian went over how to find sources for our research which was very helpful."	26	Citation - "I wish I would have learned more about plagiarism since that is the hardest thing for me when writing a paper."	24
Evaluation of sources - "The most useful thing I learned from the library sources was how to quickly determine whether or not a source was credible."	24	Other - "I wish I could have learned how to pick sources that had been written recently."	17
Keyword - "How to find different search terms so you could ask the same questions, but get different results."	20	Library - "I wish I would have learned more about how to find the sources I am looking for in the actual library, not just online."	15
Other - "I think all of the information was pretty valuable."	11	Finding books - "I wish I learned how to find a book in the library."	14
Web - "The most useful thing that I've learned from the librarian that visited is how to use the Google search tool."	10	Finding articles - "Easier ways to find articles."	13
Nothing - "I didn't find the library sessions very helpful"	9	Writing papers - "I wish we would have learned some more tips to writing a good research paper."	8
Topics - "The most useful thing I got from the library sessions was really just leaning how to narrow your topic down to the smallest thing possible."	8	Finding resources - "More ways to find sources."	6
Interlibrary loan - "The most useful thing was how to request materials through the inter-library loan."	4	Evaluation of sources - "I wish we would have learned to look up the author's credibility, that is something we had to do for our research and I wasn't completely sure how to do it."	4
Library - "How to navigate throughout the library."	4	Web - "I wish that I would've learned a better way to just go on google and find stuff."	4

Citation – "The most important thing I learned from the librarian was that the sources on many of our databases are pre-cited."	3	Interlibrary loan – "I wish I had learned more about ordering books from other libraries which work with the Staley library"	2
Writing papers – "I learned how to use my resources in a more useful way."	3	Topics – "I wish I learned how to narrow down my topic more."	2
Finding books – "How to find books on my topic"	2		

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 and describe three criteria for deciding if a website has the credibility it needs for you to use in your research project."	Pre-Test (n=206)	Post-Test (n=142)	Point Change	Percent Change
Average (out of 3)	2.51 (84%)	2.64 (88%)	0.13	5%

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

Question 5 – "List and describe three ways that scholarly journal articles differ from magazine articles or newspaper articles."	Pre-Test (n=200)	Post-Test (n=139)	Point Change	Percent Change
Average (out of 3)	2.40 (80%)	2.61 (87%)	0.21	9%

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

Pre-Test Question 9 – "How can librarians help students with the research process?"	Number of Student Responses (n=202)	Post-Test Question 9 – "How can librarians help students with the research process?"	Number of Student Responses (n=138)
Finding resources – "They can help explain step by step directions on how to find specific resources for different topics."	109	Other – "I think instead of coming in just once at the beginning of the semester, the librarians could potentially check in on the students to see if they need any help with the research process."	71
Other – "They can be readily available whenever a student needs their help."	62	Finding resources – "Librarians can help students by showing them the correct resources to use and how to use them."	37

Finding books - "They can provide a list of specific books that are helpful in specific classes/research topics."	42	Finding articles - "Librarians can help with the research process by providing help in trying to find journal articles about a difficult topic."	21
Finding articles - "Show students how to use the databases"	29	Citation - "Being able to help with style sheet issues"	14
Citation - "By teaching the methods of citation"	27	Evaluation of sources - "Discuss what sources you should include after you narrow a topic down."	11
Library - "Libraries are much more knowledgeable regarding the expanse of their library."	25	Interlibrary loan - "help gain access to books that aren't in Millikin's library."	8
Web - "Direct them to credible websites"	18	Topics - "I usually need help narrowing down my topic"	8
Evaluation of sources - "By helping them figure out if they're credible or not."	17	Finding books - "Help find books that support topics "	7
Writing papers - "They can help format their paper"	11	Keywords - "Librarians can help students narrow their search terms."	6
Topics - "give ideas for topics"	9	Writing papers - "help proofread papers to ensure no plagiarism."	6
Don't know - "I haven't gone to the library for help yet so I am not sure on how they help out."	4	Nothing - "They do a good enough job as it is"	4
Keyword - "They can help the student by coming up with helpful keywords"	3	Library - "Librarians can help with the research process by helping students find material in the Staley Library"	3
Interlibrary loan - "they can help you locate items that may not be available at your library."	2	Web - "how to tell if the website is reliable or not"	3

Table 11 (below) shows the average and mean scores on the worksheet for the library tour. Table 12 (below) presents the results of the optional survey at the completion of the tour.

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

Average Score (out of 10) (n=306)	8.6
Median Score (out of 10) (n=306)	8.8

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=192)		
5 - 10 minutes	20	10%
10 - 15 minutes	81	42%
15 - 20 minutes	60	31%
more than 20 minutes	31	16%
Now that you have completed the investigation, do you feel more comfortable using Staley Library? (n=192)		
Yes	170	89%
No	6	3%
Not sure	16	8%
Do you feel more confident about finding library resources? (n=192)		
Yes	156	81%
No	8	4%
Not sure	28	15%
Do you know who to ask for help in the library? (n=191)		
Yes	183	96%
No	3	2%
Not sure	5	3%
How do you feel about the Dr. I.B. Smart story used in the investigation? (n=192)		
I liked it	73	38%
It was ok	90	47%
I didn't like it	17	9%
I didn't pay any attention to the story	12	6%

Similar data tables for the off-sequence CWRR classes are included in Appendix D.

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 0.22 points or 7%. Students demonstrated an average 14% increase in correct answers on the multiple choice portion of Part 2 and an average .17 point or 7% increase in correct answers on the short answer questions.⁴

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 $\langle g \rangle$ 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 $g < 0.3$. Applied to this year's assessment, for the selected response questions $g = .24$ (low- g) and for the constructed response questions $g = .33$ (medium- g). These results are consistent with previous years' findings.

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 multiple choice portion of Part 2 the percentage of correct answers on the post-test was in the high Adequate (Yellow) range of the scale at 72%. The percentage of correct answers on the short answer portion of Part 2 of the post-test fell well into the Excellent (Green) range at 88%. As in the past, there was a wide disparity in the percentage of correct responses from question to question. Question 4 (databases) was in the Green range at 82%, while question 7 (sources) was in the low Yellow range at 59%. 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., databases and the credibility of peer-reviewed journal articles (questions 4 and 7). On the whole this year's assessment shows that students' information literacy confidence and abilities increased during their first year at Millikin University.

Analysis of Assessment Results by Library Instruction Goal

Almost all 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 the strongest 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 all of the questions in Part 1 and on the whole increased by .22 points (7%). The greatest increase in confidence was in knowing how to cite a source in the right format (question 14), finding articles in the library databases (question 4), figuring out where to find sources in different parts of the library (#7), and integrating sources into an assignment (#12). Using the library databases is covered extensively in library instruction sessions and these results reflect positively on that instruction. The increased confidence in finding sources in different parts of the library is encouraging, but their initial confidence on the pre-test was the lowest of all the questions at 2.70 and by the time of the post-test it was still the lowest scores at 3.01. Students' increased confidence in knowing how to cite sources in the right format is a bit puzzling since the second most popular response on post-test question 1 ("What do you wish you had learned [in the library sessions]?") was to learn more about citations. As in past years, students' confidence in finding sources "out on the web" was the highest result on the post-test (3.76). Students expressed the second greatest confidence on reading and understanding the material (3.74 on the post-test).

Students demonstrated the smallest gains in their confidence in defining and narrowing their topic (3% and 2% respectively). These are areas in which students historically show the smallest increases in confidence and sometimes decrease in their confidence. Students also expressed only a 3% increase in their confidence in sorting through irrelevant results to find what they are looking for and their score on the post-test at 3.05 was one of the lowest.

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 in 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 in Google. Students showed a moderate increase (11%) in their scores between the pre- and post-tests. The average score on the post-test (66%) falls in the Yellow range and should be higher. Identifying keywords is covered to varying degrees in library instruction both in the fall and the spring, and it is an important skill for effective searching not only in library resources, but also on the open web. Students' scores on this questions unusually show a moderate increase, but unfortunately tend to be in this range.

Question 4 on the types of resources available in library databases showed a strong improvement (20%) between the two tests, and by the time of the post-test 82% of the students answered this questions correctly, which is well into the Green range. Knowing what library databases are and what can be found in them is an essential skill for scholarly researchers. Learning about the library's databases seems to be important to students given that almost half of them mentioned it on question 1 of the post-test as one the most important things that they learned in library instruction.

Question 6 asks students to narrow a given topic. This year's scores were comparable to past years (71% two years ago, 72% last year, and 74% this year on the post-test) and at the top of the Yellow range. As mentioned above, students also showed a very small increase in their confidence in defining and narrowing topics from the pre-test to the post-test, and their scores in these areas were some of the lowest on the post-test.

Question 7 on information sources traditionally has the lowest scores, and this year continued that trend with only 59% of students answering this question correctly by the post-test (at the lower end of the Yellow range). This is a challenging question that asks students to identify peer-reviewed articles as an unbiased source of information. The second most popular (incorrect) answer that students gave is "a survey conducted by the American Beverage Association." While this would be a source of information on energy drinks, it fails to recognize the potential bias of an industry group researching their own industry, especially when discussing potential negative health effects.

Question 8, which asks about the best time in the research process to record a citation, showed a small increase (6%) in the number of correct responses from pre- to post-test, but 79% of the scores were correct on the post-test, which is in the Green range. This continues a trend of students doing well on this question.

Short Answer Questions

Question 1 of the pre-test provides important insights into students' understanding and expectations of the library and scholarly research as they begin their college careers. On the pre-test the responses tended to be rather general. Students expressed an interest in learning about finding resources, often with an emphasis on speed or efficiency ("I hope to learn how search for credible sources in the most efficient way possible."), finding their way around the library ("What I hope to learn from a librarian when he/she comes to talk is to make it easier for me to find a book. Our library is one of the biggest ones in the state possibly the country. So trying to find a book could be a little difficult."), and citations and plagiarism ("I hope to learn about what constitutes as plagiarism and how to avoid it. I also hope to learn way of citing sources properly in a text and how to properly create a work cited page when needed."). This year continued a trend that we first observed last year of students wanting to learn more about incorporating sources into their papers and about the writing process on the whole ("How to do write a paper properly and efficiently."). New this year is that several students explained that they had received information literacy instruction in high school and were looking to extend their knowledge ("Hopefully to expand the knowledge I already possess from high school. We had library talks at the very beginning of each semester all four years going over the same stuff like how to validate a website for credibility, how to cite different sources, etc... so I think i'll know most of the information presented but maybe I'll here something new to apply to my work."). Word clouds for question one can be found in Appendix C below.

On the post-test 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 was how to access and utilize the online search databases. More often than not, I have found numerous articles from these databases that have made my research from papers efficient and exciting.”). Students also identified evaluating sources and finding resources as important skill that they learned in the sessions (“The most useful thing was learning about how to determine if a source is scholarly or not.”).

For post-test question 1.2, which asks students what they wish they had learned, a majority claimed that there was nothing that they wish they had learned (“Nothing that I can really think of at the moment.”) with citation as the next popular answer (“I wish I would have learned exactly what information I need to cite and what constitutes common knowledge.”). The third most popular response category was “other” (“I wish I would've had more classroom practice.”). Fifteen students indicated that they wanted to learn more about finding materials in the library (“I wish we would learn more about the actual library and how to find sources from the Millikin library opposed to just finding sources off of a database.”) and fourteen indicated that they specifically wanted to know more about how to find books (“I wish I would've learned of how the to find books in the library.”). Here too students mentioned that they wanted to learn about efficient searching (“I wish I would have learned how to use the database more effectively, often times in my experience it was difficult to find the information I was looking for and the databases would never help. I could go online and find a source 200x faster that was more effective.”) and some shared the perception that they had already learned the material before (“Personally, I didn't learn much on my last librarian session because we were going over stuff that we already did the first semester and in high school.”).

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. As is typical, students demonstrated only a modest increase in correct answers from the pre-test to the post-test (5%), but their scores on the pre-test were already quite high (2.51 out of 3 or 84%⁵). Clearly students are receiving some type of website evaluation training prior to starting college. For example, one answer on the pre-test specifically mentioned the CRAAP test, which is a common method for evaluating websites, and a number of the pre-test answers were rather sophisticated (“The author is a credible source, aka the author of philosophy is not trying to inform readers on how to perform heart surgery because she would not be an expert in that field”). However, many of the criteria that are mentioned on the pre-test tend to be very black and white (e.g., all websites that allow user comments are deemed bad) or they are applied incorrectly (e.g., students correctly identify the importance of a website URL in assessing its authority, but incorrectly identify .com websites as typically the most credible) or they confuse relevance to their topic with reliability. By the post-test, students' answers tend to be slightly more nuanced (“You need to look at the domain of the website to determine if the website is credible. If it is a .com, it is most likely not very credible. If it is a .edu, .org, or .gov, you know it is credible.”).

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 9% to 2.61 out of 3 (87%). Both the pre-test (80% correct) and the post-test were in the Green range. Just as with website evaluation, it seems that some students are receiving instruction on scholarly publishing in high school. For example, some students on the pre-test used specific vocabulary to describe scholarly articles (“Scholarly journal articles are usually peer-reviewed”). On the pre-test and to a lesser extent on the post-test, students tended to see scholarly journals as factual and always reliable, while popular sources like newspapers and magazines they described as biased and possibly fabricated (“1. Scholarly journals contain more factual information. 2. Media articles contain information that keeps people intrigued, even if it isn't entirely true. 3. Newspaper and magazine

⁵ The average standard deviation between the two coders for question 3 was 0.15. For question 5 it was 0.11.

articles are more likely to contain logical fallacies.”), which overlooks the fact that both types of sources have their pros and cons and be useful to researchers in different ways.

Question 9, which asks how librarians can help with the research process, is intended in part to give a better sense of students’ perceptions of the librarians both before and after the instruction sessions. On both the pre- and the post-tests, students identified a range of activities that librarians can help with. Finding articles, books, and other resources were some of the most popular answers on the pre- and post-tests, but students also noted that librarians can help with evaluating sources and can assist with citations. As in the past, a number of students took this question as an evaluation of the librarians’ performance, and they made suggestions about what librarians should do in and out of the classroom to help students with their research. Several students mentioned the importance of being patient with students (“Be patient and helpful in the research process.” or “Just be kind and helpful. Not everyone knows how to navigate a library.”). On the post-test several students mentioned that they would like librarians to be more involved with their classes and the research process (“It would be nice if they could reach out to students more. Maybe professors can communicate to librarians that students for that class are having a research paper. Then, Librarians can reach out to the students and ask if they’re going to need help along the way.”).

Analysis of Results for the Self-Guided Tour

There were 192 unique responses to the optional survey that students complete after taking the self-guided tour, which is approximately 63% of the 306 students who completed the tour. A sizable majority of respondents claimed to have met the tour’s learning goals of making students feel more comfortable in the library (89%), more confident using library resources (81%), and more knowledgeable about who to ask for help in the library (96%). For most students, it took them 10-15 minutes to complete the tour, which was the target time range. All of the results from the survey can be seen in Table 12 (above). It is important to note that the survey was optional and these self-selected responses may not be representative of the students who completed the tour.

This year the librarians again recorded the scores for the worksheet that students complete during the tour. 306 worksheets were collected by the librarians and the average score was 8.6 out of 10. Based on a class of 482 this means that approximately 63% of first year students completed the self-guided tour (the results are in Table 11 above). However, this participation rate underrepresents the actual number of student who completed the tour since no scores were recorded for one section of IN140 and partial scores were recorded for two other sections. Approximately 350 worksheets were taken by students (a 73% completion rate), which may more closely reflect the number of students who actually completed the tour.

Overall, 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 Off-Sequence CWRR classes

This year data were collected from three off-sequence CWRR I sections in spring 2019 and two off-sequence CWRR II sections in fall 2018. These classes were small (29 students in the three sections of CWRR I and 37 students in the two sections of CWRR II), and the participations rates were roughly comparable to the traditional classes. There are perennial difficulties with assessing these off-sequence courses since they are a mix of transfer students, international students, and students retaking CWRR. Not only do students come into these classes with extremely varied backgrounds and preparation, but also some of them are taking these classes for a second time and some have not taken them before.

For part 1 of the assessment, the percentage increase from pre-test to post-test was roughly comparable to the traditional classes (5% increase versus 7% increase). The absolute scores were lower for both the pre- and post-test for the off-sequence classes, and for almost half of the questions students expressed a decrease in confidence from the pre-test to the post-test. The areas where students showed the greatest increase in confidence did track with the traditional classes, although students expressed the largest increase in knowing whether they have done a good job on an assignment (30% increase). Again, the fact that some students are repeating CWRR I and/or CWRR II and may have previously received library instruction while some students are new to these classes certainly skews the results in unpredictable ways.

In Part 2 of the assessment, the average percentage who answered the questions correctly on the multiple choice questions was very close between the traditional and off-sequence sections (72% versus 71%). But while the off-sequence classes scored higher on questions 4 (databases), 6 (narrowing), and 7 (sources), they did much worse on 2 (keywords) and 8 (citation) and their scores decreased in these areas between the pre- and post-test. For the selected response questions, the off-sequence students performed approximately the same in identifying criteria for a credible website (2.56 out of 3) but did better on identifying criteria distinguishing scholarly journals from popular sources (3.00 out of 3). For question one, students in the off-sequence CWRR I classes also identified finding resources as the thing that they most hoped to learn in their library sessions, and the CWRR II classes also stated that the most important thing that they learned in the library sessions was how to find articles. Finally, the off-sequence students' responses also tracked the traditional classes in how they thought librarians could help students. On the pre-test they identified "finding resources" most commonly, while on the post-test they said "other" – they also misinterpreted the question as asking what librarians should do to improve our services. The complete results from both the pre- and post-tests for the off-sequence CWRR classes can be found in Appendix D.

Improvement Plan

An ongoing challenge with the library assessment is the lack of participation. This year, approximately 45% of the students enrolled in CWRR I/HWS 1 participated in the pre-test and 35% of the students enrolled in CWRR II/HWS 2 participated in the post-test. These participation rates are comparable to last year (47% for CWRR I and 28% for CWRR II). As in the past, the pre- and post-tests were administered outside of the library instruction sessions and it is up to the instructors if they allocate class time for students to take the assessment. The advantage of this system is that it does not impinge on the limited library instruction time, but it does mean that it ultimately falls to the instructors to get their students to participate in the assessment. 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 2022. For example, the participation rate may be higher from the HWS classes, which would certainly skew the results. Despite the limitations, the Instruction Coordinator continues to stress the importance of the assessment to students and faculty.

The return to the self-guided tour format seemed to be successful. More than two thirds of the first-year students completed the tour, and they performed well on the accompanying worksheet. Those who completed the accompanying survey expressed opinions that showed that they achieved the learning outcomes for the tour. However, on question 1 of the post-test assessment, 29 students said that they wish they had learned more about the library or specifically where to find books in the library. One of the tour questions did require participants to go to the book stacks and find a particular section while another question asked them to find a series of books in the reference collection. The Instruction Coordinator will work with the librarians to see if there is a way that those questions can be modified to increase students' confidence about finding physical materials in the library. This may also be a matter of doing a better job of connecting the material of the tour with our in-class library instruction, particularly in the fall semester.

As mentioned above, question 3 on website evaluation saw students perform well on both the pre- and the post-test, although the responses were slightly more nuanced by the time of the post-test. However, this question is predicated on a checklist conception of website evaluation where certain criteria such as address, author, or the number of advertisements determine the credibility of a website. The problem is that in the current era of fake news and information dissemination by social media, this checklist approach is no longer adequate.⁶ The librarians are considering changing the nature of their website evaluation instruction to encompass these changes in the information landscape; these pedagogical changes may necessitate changes to question 3 on the assessment.

Although students performed well on question 5, here too they often displayed very black and white thinking when they distinguished scholarly journals and popular sources like magazines and journals. While scholarly journals may generally be better sources of information, especially in the context of scholarly research and writing, this does not mean that all popular sources are inherently biased or free of facts. Question 7, which identifies a peer-reviewed article as an objective and accurate source of information on the health benefits and drawbacks of energy drinks, may reinforce this perception. Distinguishing scholarly from popular sources is an important part of our instruction in CWRR/HWS and there may be no way to modify these questions to avoid this issue. However, the librarians will use their instruction time to continue to stress that different sources have different strengths and weaknesses and may be more or less useful given the context.

⁶ For example Mike Caulfield's *Web Literacy for Student Fact-Checkers* (<https://webliteracy.pressbooks.com>) provides a different approach to website evaluation that uses professional fact checkers as its model. This approach is supported by the work of Sam Wineburg and Sarah McGrew who found that fact checkers outperform students and subject experts when evaluating websites: Wineburg, S., & McGrew, S. (2017, October). *Lateral Reading: Reading Less and Learning More When Evaluating Digital Information* (Stanford History Education Group Working Paper No. 2017-A1). Retrieved from <https://ssrn.com/abstract=3048994>

On questions 1 and 9, a fair number of students stated or made comments that indicated that they had received information literacy instruction prior to starting at Millikin. It may be helpful to introduce a question on the pre-test that specifically asks students about their prior experience with the topic. Through informal polling the Instruction Coordinator has found that roughly half of the first year students have received some type of information literacy instruction in middle school or high school, but it might be helpful to have a clearer sense of this from more students. This information could be helpful as the librarians adjust their instruction in future academic years.

Finally, the past academic year was the first year that the Honors 150 and 151 classes adopted their new Honors Writing Studio format. In the HWS, students develop a proposal for a research project in the fall semester and then continue working on the same project in the spring semester when they produce a research paper and a multi-modal project on that topic. This past year, the librarian intentionally maintained the same approach to their instruction, but for academic year 2019-2020, library instruction will be changing. Part of the change will be in timing. For example, students will receive their library instruction earlier in the spring semester since they start that semester already knowing the topic that they will be working on. We will also move our discussion of periodical types to the fall semester since students need to find trade periodicals in their discipline during the fall. There will also be changes to the content of the instruction, especially in the spring semester. At a spring 2019 meeting between the librarians who taught the HWS classes and the HWS faculty, they discussed the spring sessions being more collaboratively taught between the classroom faculty and librarians, with a focus on discipline specific research and resources. All of these changes may necessitate a separate assessment for honors students, particularly part 2 on information literacy skills. This has not been finalized, but is probably the approach that we will take in the upcoming academic year.

Conclusion

On the whole, the assessment of library instruction in University 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 University Seminar/CWRR, the opportunity to meet with classes on several occasions allows the librarians to introduce and then reinforce multiple concepts with the students. It also affords an opportunity for students to begin to develop a relationship with the librarians and to see them as a valuable academic resource. The library faculty look forward to working again with their CWRR, HWS, and Seminar colleagues during the 2019-2020 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?
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 and describe **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 [a screenshot of database is included], what type of research resources should you expect to find in your results?

Journal Articles
Books

5. List and 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 peer-reviewed article in a nutrition journal.
A website for one of the energy drink manufacturers.
A survey conducted by the American Beverage Association.

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. How can librarians help students with the research process?

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, information literacy, etc. [use for very broad answers]

P = Writing papers, the mechanics of writing

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

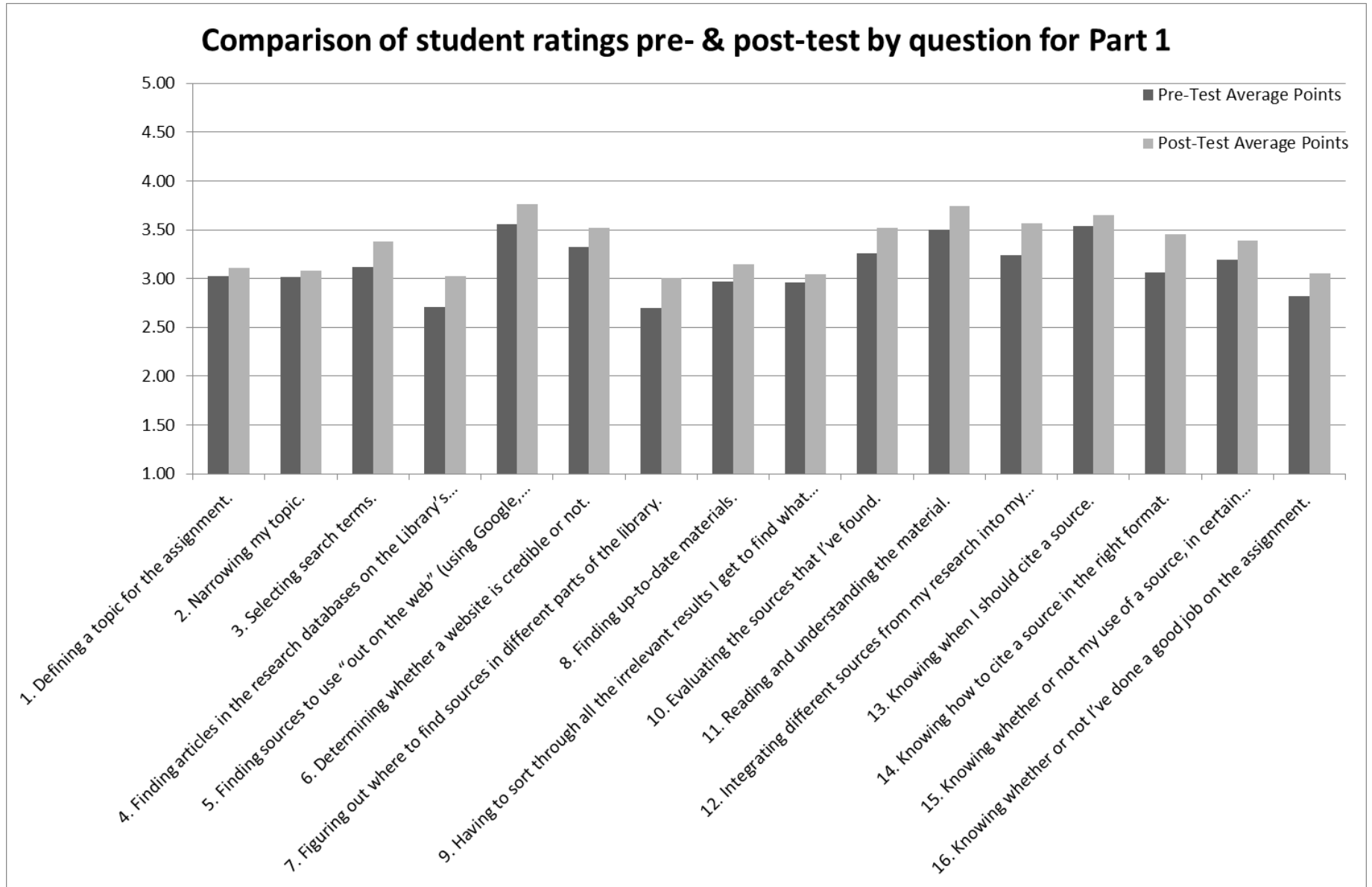
2 = Two differences correctly identified

3 = Three differences correctly identified

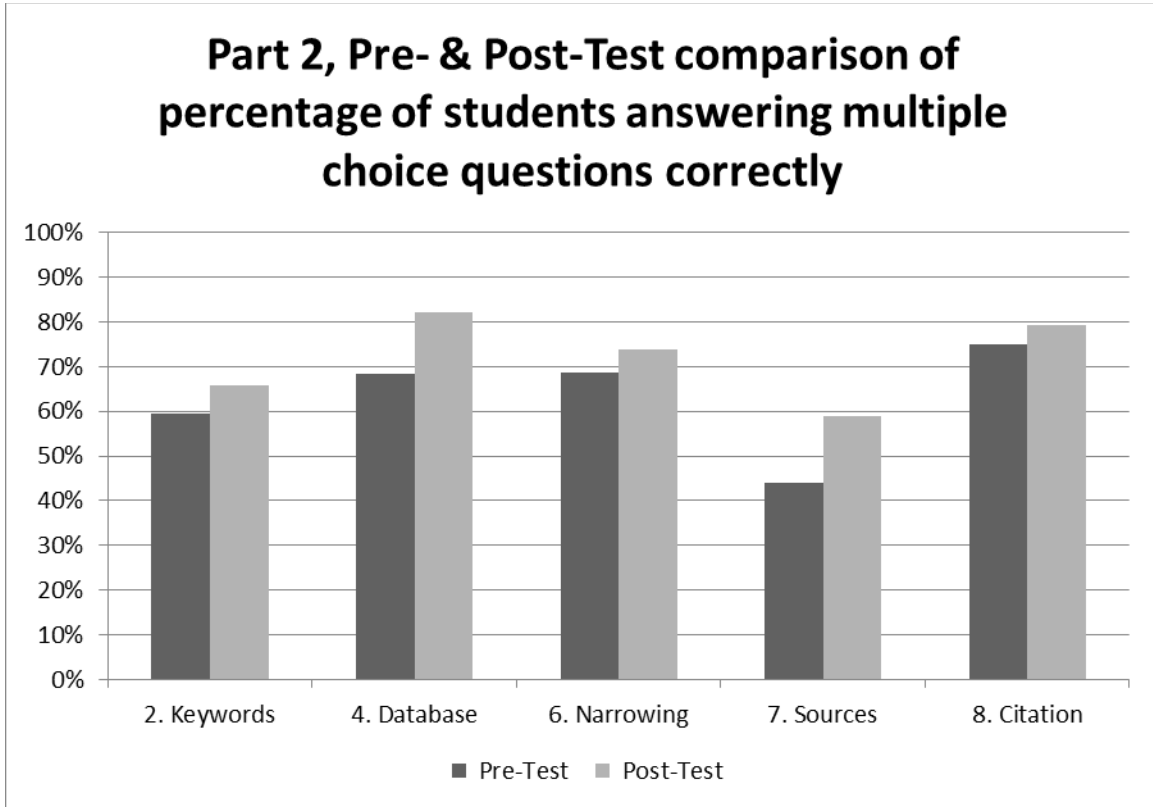
Appendix B

Graphical Representation of Pre- and Post-Test Results

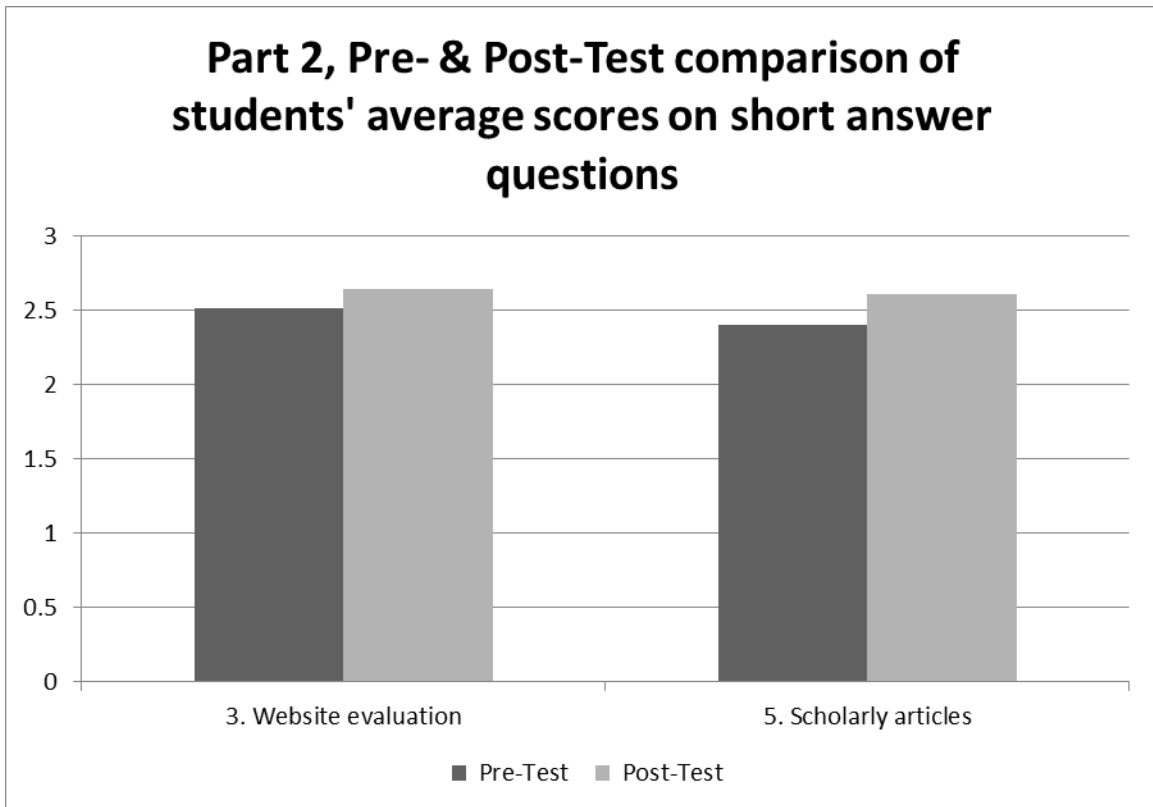
Graph 1



Graph 2



Graph 3



Appendix D

Off-Sequence CWRR Results⁷

Part 1

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

Question Scale 1 - 5 1 = very difficult 5 = very easy	Pre-Test Average Points (n=15)	Post-Test Average Points (n=14)	Point Change	Percent Change
1. Defining a topic for the assignment	3.13	2.86	-0.28	-9%
2. Narrowing my topic	3.00	3.14	0.14	5%
3. Selecting search terms	3.20	3.36	0.16	5%
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.86	3.29	0.43	15%
5. Finding sources to use "out on the web" (example - Google, Wikipedia, websites)	3.47	3.36	-0.11	-3%
6. Determining whether a website is credible or not	3.67	3.36	-0.31	-8%
7. Figuring out where to find sources in different parts of the library	2.67	3.14	0.48	18%
8. Finding up-to-date materials	3.07	3.29	0.22	7%
9. Having to sort through all the irrelevant results I get to find what I need	2.93	2.64	-0.29	-10%
10. Evaluating the sources that I've found	3.07	3.00	-0.07	-2%
11. Reading and understanding the material	3.73	3.71	-0.02	-1%
12. Integrating different sources from my research into my assignment	3.20	3.50	0.3	9%
13. Knowing when I should cite a source	3.13	3.71	0.58	19%
14. Knowing how to cite a source in the right format	3.13	3.07	-0.06	-2%
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	3.07	3.43	0.36	12%
16. Knowing whether or not I've done a good job on the assignment	2.47	3.21	0.75	30%
Average	3.11	3.25	0.14	5%

⁷ The off-sequence results are from two sections of CWRR II in fall 2018 and two in-person and one online section of CWRR I in the spring 2019.

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

Rating	Pre-Test (n=15)	Post-Test (n=14)	Percent Change
1 - This is very difficult	3%	5%	53%
2 - This is difficult	25%	18%	-27%
3 - This is neutral	39%	34%	-12%
4 - This is easy	24%	33%	39%
5 - This is very easy	9%	10%	7%

Part 2

Table D.3. Pre- and post-test comparison of percentage of students answering multiple choice questions correctly

Multiple Choice Question	Pre-Test (n=17)	Post-Test (n=9)	Percent Change
2. Keywords	47%	44%	-6%
4. Database	82%	89%	8%
6. Narrowing	71%	89%	26%
7. Sources	41%	89%	116%
8. Citation	71%	44%	-37%
Average	62%	71%	14%

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

Pre-Test Question 1 - "What do you hope to learn from the library sessions?"	Number of Student Responses (n=15)
Finding resources - "A refresher on how to find good sources."	8
Other - "I hope to learn something new in the research aspect of things."	4
Citation - "I hope to learn how to correctly cite a source in any format even if there if information missing."	3
Evaluation of sources - "I hope to learn how to differentiate research better."	3
Writing papers - "I hope to learn more about what I do and do not need in my paper."	2
Topics - "Narrowing down my topic"	2
Finding books - "Perhaps how to use real books instead of online sites."	1
Web - "How can i know that a website is credible"	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(s)?	Number of Student Responses (n=8)	Post-Test Question 1.2 - What do you wish that you would have learned?	Number of Student Responses (n=7)
Finding articles - "How to use the data bases and how to access them was the most useful information I learned."	4	Nothing - "There was nothing I wish I would have learned."	3
Finding resources - "I thought it was a good refresher for me as to how I can find the resources that I need."	4	Citation - "I wish we learned how to properly do a works cited page because I think I have a ton errors in mine."	2
Finding books - "The most useful thing I learned from the library session was that I can look up books that are in the library online."	2	Other - "I wish I would take this session right before we are doing a research project so all the information would be fresh before research project."	1
Evaluation of sources - "I learned how to tell if a source is valid or invalid."	1	Finding resources - "One on one time to really delve into finding resources that work for my topic."	1
Other - "The most useful thing that I learned from the library session was how to use research in the library at Millikin"	1		

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

Question 3 - "List and describe 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=8)	Point Change	Percent Change
Average (out of 3)	2.38 (79%)	2.56 (85%)	0.18	8%

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

Question 5 - "List and describe three ways that scholarly journal articles differ from magazine articles or newspaper articles."	Pre-Test (n=13)	Post-Test (n=7)	Point Change	Percent Change
Average (out of 3)	2.08 (69%)	3.00 (100%)	0.92	44%

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

Pre-Test Question 9 – "How can librarians help students with the research process?"	Number of Student Responses (n=13)	Post-Test Question 9 – "How can librarians help students with the research process?"	Number of Student Responses (n=8)
Finding resources – "explain how to find sources"	8	Other – "Being as detailed as possible"	4
Other – "give them options"	5	Finding articles – "Tell them what database to use"	2
Library – "Librarians can help students with the research process by pointing the student in the right direction of the library."	3	Library – "They can answer questions about the material in the library."	2
Finding articles – "helping them to find articles that might be helpful"	1	Finding resources – "help with finding information about the topics"	2
Evaluation of sources – "help them determine which is the best use of source"	1	Evaluation of sources – "telling them how to spot fake articles."	1
Keyword – "By making sure they are using the correct words for searching something"	1	Keyword – "help them with keywords to search"	1
Topics – "Librarians are also a great aid when narrowing my topic."	1	Topics – "condensing their topics if they are too general"	1
Web – "They can help by showing them some credible websites"	1		