Millikin University

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 2020-2021

Reported by Matthew Olsen, Instructional Services Coordinator
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Summary

During the 2020-2021 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 typically 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 180 students (44%) took the pre-test and approximately 67 students (21%) 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."
- This assessment cycle continued the practice of separating the results for the traditional (CWRR) and honors (HWS) students. On the whole, the honors students performed better on the skills portion of the assessment and reported slightly higher average confidence in the research process.
- Students claimed that learning about finding articles in the library databases and using the library were the most useful things that they learned through their library instruction. Almost all the students also claimed using scholarly journals and websites as research resources for their assignments in their first year at Millikin University while far fewer students reported using paper books or reference sources like encyclopedias or dictionaries.
- Due to COVID-19 restrictions, the self-guided library tour used with University Seminar classes was moved to a virtual format. While the participation rate was down, a majority of students who completed the tour and subsequent survey claimed that the tour met its stated learning goals.
- The participation rate on the post-test, particularly for the HWS sections was very low. As Millikin University moves back to in-person instruction, the participation rate for the assessment should improve.

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 who 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 use information critically and ethically throughout their lives.

The research instruction program corresponds directly with the Critical Writing, Reading, and Researching (CWRR) and Honors Writing Studio (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 learning goals mapped to the University's learning goals

Library 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 University Studies courses – CWRR, HWS, and University Seminar. The librarians use a 2:2 instruction model for CWRR and University Seminar, with two sessions in the fall and two sessions in the spring. The fall sessions can be taught in either University Seminar or CWRR 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 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 faculty to schedule the

library session(s) appropriately so that students learn and apply skills in a way that makes them immediately relevant to their research needs. This academic year was unique in that a majority of the classes were taught in an online format due to COVID-19. While most of the classes were taught synchronously, there were some asynchronous, online CWRR I and CWRR II classes.

Honors Writing Studio requires a slightly different approach. The HWS students spend the fall semester developing a detailed research proposal that they use in the spring to write a research paper and to produce a multi-modal project. Thus, it is necessary to provide them with more library instruction early on so that they can successfully complete their proposal and be well-situated for the spring semester. The librarians met twice with each HWS 1 class in the fall not only to familiarize them with Staley Library research resources, but also for work on keyword development and source choice. In the spring semester, the librarians met with only one of the HWS 2 sections.

During the 2020-2021 academic year, the librarians provided instruction to 44 sections of CWRR and HWS, 17 sections of University Seminar, and 5 sections for the "off-sequence" CWRR (i.e., CWRR II offered in the fall and CWRR I offered in the spring). A majority of the instruction was done online, synchronously using Zoom, but we did teach a few classes in-person and about a third of the sections that we worked with were done in an online, asynchronous format. For these classes we provided a mixture of online guides, videos, worksheets, and participation in a Moodle forum. For the synchronous, online courses the librarians used instructional technologies like Poll Everywhere, Padlet, Answer Garden, and the breakout room feature in Zoom.

Matthew Olsen coordinates the research instruction program and shares the instruction with library faculty Rachel Bicicchi, Cindy Fuller (former Library Director), Elizabeth Hollendonner, and Amanda Pippitt (current Library Director). 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, these 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 no matter how it is discovered. They also focus on active learning and provide students opportunities to apply the skills that they are learning.

Assessment Methods

Pre- and Post-Test Assessment Methods

The 2020-2021 academic year marked the fifteenth 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 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. This assessment cycle was the second time that CWRR and HWS students' results were gathered separately.

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 on the pre-test asks students about their experience with information literacy instruction prior to arriving at Millikin while the post-test asks about the research resources that students used during their first year at Millikin. The complete list of questions can be found in Appendix A.

To facilitate reporting of the range of answers to the short answer questions, the responses to question 1 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 Elizabeth Hollendonner performed the coding. After review, for any responses the two librarians coded differently, the librarians discussed and then agreed on common codes. Questions 3 and 5 were also graded separately by the Instruction Coordinator and Elizabeth Hollendonner 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. The tour has three broad learning goals:

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

In the past, the tour has employed a mystery narrative format and a worksheet that guides students physically around the library. This fall, due to COVID-19 restrictions, we created an online tour[2] with an online worksheet that the students completed after going through the tour. The students' grades on the worksheet were shared with their University Seminar instructors.

Academic year 2020-2021 also continued the Faculty Assessment of Library Instruction survey. This electronic survey is sent to every faculty member for whom library instruction was conducted including those outside of the first year University Studies 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.

[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: https://projectinfolit.org/pubs/evaluating-information-study/pil_evaluating-information_2010-11-01.pdf
[2] https://millikin.libguides.com/tour

Assessment Data

Fall Pre-Test[3]

Part 1: Average score – CWRR = 3.06 / HWS = 3.11 / weighted average = 3.08 (5 point scale)
Part 2: Multiple-choice: Average percentage of students answering the question correctly – CWRR = 67% / HWS = 86% / weighted average = 73%
Short answer: Average score – CWRR = 2.37/ HWS = 2.52 / weighted average = 2.42 (3 point scale)

Spring Post-Test[4]

Part 1: Average score – CWRR = 3.24 / HWS = 3.04 / weighted average = 3.23 (5 point scale)
Part 2: Multiple-choice: Average percentage of students answering the questions correctly – CWRR = 81% / HWS = 90% / weighted average = 81%
Short answer: Average score – CWRR = 2.61 / HWS = 2.38 / weighted average = 2.60 (3 point scale)

Table 2. Pre- and post-test results by library learning goal [scores are weighted averages of the CWRR & HWS results]

Staley Library Learning Goals (LG)			
1. Information Sources **Part 1** **Questions 7 & 8** Pre-Test Avg. = 2.73 Post-Test Avg. = 3.07 Improvement = 12% **Part 2** **Questions 4 & 5** Pre-Test Avg. = 74% Post-Test Avg. = 86% Improvement = 16% **Total for LG 1** Improvement = 14%	**2. Search Strategies** **Part 1** **Questions 1, 2, 3, 4 & 5** Pre-Test Avg. = 3.10 Post-Test Avg. = 3.20 Improvement = 3% **Part 2** **Question 2 & 6** Pre-Test Avg. = 73% Post-Test Avg. = 73% Improvement = 0% **Total for LG 2** Improvement = 2%	**3. Evaluation of Information** **Part 1** **Questions 6, 9 & 10** Pre-Test Avg. = 3.10 Post-Test Avg. = 3.28 Improvement = 6% **Part 2** **Questions 3 & 7** Pre-Test Avg. = 78% Post-Test Avg. = 88% Improvement = 13% **Total for LG 3** Improvement = 10%	**4. Ethical Aspects of Information** **Part 1** **Questions 13, 14 & 15** Pre-Test Avg. = 3.13 Post-Test Avg. = 3.39 Improvement = 8% **Part 2** **Question 8** Pre-Test Avg.= 77% Post-Test Avg.= 85% Improvement = 10% **Total for LG 4** Improvement = 9%

[3] For the pre-test the number of student responses was not the same from question to question. For the CWRR students, on Part 1 the average number of responses was 121 (mode = 121). For the HWS students on Part 1 the average was 60 (mode = 60). For CWRR on Part 2, questions 2-8 the average was 120 (mode = 120). For HWS on Part 2 the average was 62 (mode = 62). 343 students were enrolled in CWRR I and 66 students were enrolled in HWS 1. The participation rates on the pre-test were lower than last year (44% vs. 58%), but the same as the year before (45%).

[4] The post-test also exhibited different numbers of responses from question to question. For Part 1 for the CWRR students the average number of responses was 66 (mode = 66). For HWS on Part 1 the average was 3 (mode = 3). For CWRR on Part 2, questions 2-8 the average was 62 (mode = 62). For HWS on Part 2 the average was 2 (mode = 2). 262 students were enrolled in CWRR II and 61 students were enrolled in HWS 2. While the participation rate for CWRR II was much higher than last spring, HWS 2 participation in the post-test continued to be very low. As instruction across campus returns to normal in AY2021-2022, the participation rate should increase.

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 Graphs 1 and 2 (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.

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** CWRR / HWS (n=121 / 60)	**Post-Test Average Points** CWRR / HWS (n=66 / 3)	**Point Change** CWRR / HWS	**Percent Change** CWRR / HWS
1. Defining a topic for the assignment	3.11 / 3.13	2.98 / 3.33	-0.12 / 0.20	-4% / 6%
2. Narrowing my topic	2.97 / 3.00	3.12 / 3.33	0.15 / 0.33	5% / 11%
3. Selecting search terms	3.02 / 3.18	3.23 / 4.00	0.20 / 0.82	7% / 26%
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.60 / 2.48	2.88 / 3.00	0.28 / 0.52	11% / 21%
5. Finding sources to use "out on the web" (example - Google, Wikipedia, websites)	3.60 / 3.73	3.76 / 3.00	0.16 / -0.73	5% / -20%
6. Determining whether a website is credible or not	3.21 / 3.28	3.48 / 3.33	0.27 / 0.05	8% / 2%
7. Figuring out where to find sources in different parts of the library	2.51 / 2.30	3.00 / 2.67	0.49 / 0.37	19% / 16%
8. Finding up-to-date materials	3.11 / 2.88	3.12 / 2.00	0.01 / -0.88	0% / -31%
9. Having to sort through all the irrelevant results I get to find what I need	2.84 / 2.80	3.09 / 2.67	0.25 / -0.13	9% / -5%
10. Evaluating the sources that I've found	3.19 / 3.23	3.44 / 2.33	0.25 / -0.90	8% / -28%
11. Reading and understanding the material	3.50 / 3.82	3.62 / 3.33	0.13 / -0.48	4% / -13%
12. Integrating different sources from my research into my assignment	3.26 / 3.52	3.29 / 3.00	0.03 / -0.52	1% / -15%
13. Knowing when I should cite a source	3.31 / 3.45	3.55 / 3.67	0.24 / 0.22	7% / 6%
14. Knowing how to cite a source in the right format	2.94 / 3.12	3.26 / 3.00	0.32 / -0.12	11% / -4%
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	2.98 / 3.13	3.33 / 2.67	0.35 / -0.47	12% / -15%

16. Knowing whether or not I've done a good job on the assignment	2.87 / 2.68	2.68 / 3.33	-0.19 / 0.65	-7% / 24%
Average	**3.06 / 3.11**	**3.24 / 3.04**	**0.18 / -0.07**	**6% / -2%**

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

Rating	**Pre-Test** CWRR / HWS (n=121 / 60)	**Post-Test** CWRR / HWS (n=66 / 3)	**Percent Change** CWRR / HWS
1 – This is very difficult	4% / 4%	4% / 0%	0% / -100%
2 – This is difficult	24% / 28%	20% / 25%	-19% / -10%
3 – This is neutral	39% / 30%	33% / 46%	-14% / 56%
4 – This is easy	28% / 30%	35% / 29%	22% / -4%
5 – This is very easy	5% / 8%	9% / 0%	70% / -100%

Table 5 (below) and Graphs 3 and 4 (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** CWRR / HWS (n=120 / 62)	**Post-Test** CWRR / HWS (n=62 / 2)	**Percent Change** CWRR / HWS
2. Keywords	53% / 89%	66% / 50%	24% / -44%
4. Database	67% / 81%	84% / 100%	26% / 24%
6. Narrowing	78% / 85%	81% / 100%	3% / 17%
7. Sources	63% / 87%	90% / 100%	44% / 15%
8. Citation	72% / 87%	84% / 100%	17% / 15%
Average	**67% / 86%**	**81% / 90%**	**22% / 5%**

Tables 6, 7, 8, and 9 (below) list the number of student responses that matched a given category for question 1 and provide a representative response for each category. Student responses were coded in up to three different categories.

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

Pre-Test Question 1 – "What do you hope to learn from the library sessions?"	**Number of Student Responses** (n=120)
Finding resources – "How to find the most valuable sources for specific topics."	46
Library – "How to navigate and use the library to my advantage."	38
Other – "I hope to learn more about Information Literacy."	20
Citation – "I am hoping to learn more about how to properly cite work"	19

Evaluation of sources – "I hope and would like to learn how to correctly choose the book or source that best fit in our research project."	17
Finding books – "I hope to learn how to access books more."	16
Writing papers – "I want to learn how to be more confident when I'm writing a paper."	12
Finding articles – "I hope to learn how to use the school databases to find sources."	11
Don't know – "I'm not sure."	5
Keywords – "I would as well like to learn to developing keywords to use in research paper."	1
Web – "I hope to learn good internet sources instead of standard Wikipedia etc."	1

Table 7. Coded student responses to HWS pre-test question 1

Pre-Test Question 1 – "What do you hope to learn from the library sessions?"	**Number of Student Responses** (n=62)
Library – "I hope to learn where and how to access materials in the library."	33
Finding Resources – "I hope we can learn what resources there are for us to utilize."	19
Citation – "I hope to learn more about citing works and avoiding/detecting plagiarism."	16
Finding articles – "How to access the online databases that Millikin uses."	15
Evaluation of sources – "I need to know how to differentiate from accurate sources to not so accurate."	9
Other – "I am hoping to learn more about the situation."	7
Writing papers – "[H]ow to better integrates cites and evidence into my writing."	5
Finding books – "I would also like to know how to find book in this library."	3
Don't know – "I really have nothing specific I want to learn"	1
Keywords – "I hope to learn about which key words to use to find exactly what I need."	1
Topics – "I would like to learn how to narrow a topic because I often have way to many ideas and then have trouble bringing them to a clear focus."	1
Web – "How to navigate google to find credible sources"	1

Table 8. Coded student responses to CWRR 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=60)	**Post-Test Question 1.2 – "What do you wish that you would have learned?"**	**Number of Student Responses** (n=57)
Finding articles – "Learning how certain databases worked and had information on the topics i needed was fantastic."	34	**Nothing** – "I thought the presentation covered everything I was curious about."	13
Library – "I think that the description and online tour we took of the library itself was very helpful."	12	**Citation** – "I wish I had learned how to cite better without the use of an online generator"	11

Finding resources – "How to sort out irrelevant sources."	9	**Finding articles** – "I wish I would have learned how to find articles on databases that I have found before, but did not save the link."	10
Evaluation of sources – "[H]ow to recognize a reliable source."	4	**Library** – "I wish COVID wasn't around and we could've did some on hand things in the library."	7
Finding books – "I learned how to see if a book was in the library before I went"	3	**Writing papers** – "I wish I would I have learned more on how to write a better paper"	5
Topics – "I learned how to brainstorm topics, and then to choose the topic depending on which topic you can articulate the best, not neccessarily the topic you know the most about."	3	**Finding resources** – "I wish I would have learned a little bit more about how to find sources outside of the database that are credible."	5
Keywords – "The most useful thing I found was how to narrow down search topics using different methods of search terms."	2	**Interlibrary loan** – "More in depth with how to order books from other libraries."	4
Citation – "The most useful thing that I learned during the library days were how to cite sources"	1	**Finding books** – "How to find books easier just looking around the library in person."	3
Interlibrary loan – "The most useful thing was learning how to use the … ILL program."	1	**Evaluation of sources** – "I wish I would have learned how to identify if a source is reliable or not."	3
Nothing – "I don't feel like I learned much"	1	**Other** – "I wish I would have learned more about the writing center."	3
Other – "How to find the answer to a question on my own"	1	**Topics** – "I wish I would've learned how to find interesting topics that have not been repeatedly used in the past."	1
Web – "The most important thing I learned was how to navigate through websites to find resources to use in my paper."	1	**Web** – "I wish I learned about other websites I could use. I understand googles method and also how to use millikin's database, but I wish I could've learned about other places that I could go to when I need to."	1

Table 9. Coded student responses to HWS 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=2)	**Post-Test Question 1.2 – "What do you wish that you would have learned?"**	**Number of Student Responses** (n=2)
Finding articles – "learning how to use the online database well"	1	**Don't know** – "unsure"	1
Finding resources – "How to navigate the searched to find good research and information"	1	**Keywords** – "how to use the best keywords for searches"	1

Tables 10 and 11 (below) and Graphs 5 and 6 (Appendix B) show the pre- and post-test scores for the two constructed response questions in Part 2 of the assessment.[5]

Table 10. Comparison of student 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** CWRR / HWS (n=118 / 62)	**Post-Test** CWRR / HWS (n=61 / 2)	**Point Change** CWRR / HWS	**Percent Change** CWRR / HWS
Average (out of 3)	**2.55 / 2.49 (85% / 83%)**	**2.55/ 2.50 (85% / 83%)**	**0.00 / 0.01**	**0% / 0%**

Table 11. Comparison of student 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** CWRR / HWS (n=117 / 61)	**Post-Test** CWRR / HWS (n=62 / 2)	**Point Change** CWRR / HWS	**Percent Change** CWRR / HWS
Average (out of 3)	**2.18 / 2.55 (73% / 85%)**	**2.66 / 2.25 (89% / 75%)**	**0.48 / -0.30**	**22% / -12%**

Tables 12 and 13 (below) show the pre- and post-test responses to question 9 on Part 2 of the assessment.

Table 12. Student responses to pre-test question 9

Pre-Test Question 9 – "Prior to coming to Millikin University did you receive instruction in any of the following areas? (check all that apply)"	**Number of Student Responses** CWRR / HWS (n=119 / 61)	**Percent of Student Responses** CWRR / HWS
Understanding the strengths and weaknesses of different information sources	89 / 42	75% / 69%
Using library databases (Gale, EbscoHost, etc.)	35 / 32	29% / 52%

[5] The average standard deviation between the two coders for question 3 was 0.11. For question 5 it was 0.17.

Using a library catalog	19 / 12	16% / 20%
Developing keywords to use in your searches	57 / 31	48% / 51%
Evaluating websites	81 / 42	68% / 69%
Creating MLA, APA, Chicago, etc. style citations	92 / 55	77% / 90%

Table 13. Student responses to post-test question 9

Post-Test Question 9 – "Which of the following information sources have you used for assignments in any of your classes during your first year at Millikin University? (check all that apply)"	**Number of Student Responses** CWRR/ HWS (n=62 / 2)	**Percent of Student Responses** CWRR/ HWS
Paper books	24 / 0	39% / 0%
E-books	37 / 0	60% / 0%
Encyclopedias or dictionaries	14 / 0	23% / 0%
Scholarly journals	57 / 2	92% / 100%
Newspapers or magazines	30 / 1	48% / 50%
Websites	58 / 1	94% / 50%

Table 14 (below) shows the average and median scores on the worksheet for the library tour. Table 15 (below) presents the results of the optional survey at the completion of the tour.

Table 14. Student scores on the self-guided tour worksheet[6]

Average Score (out of 10) (n=160)	8.7
Median Score (out of 10) (n=160)	9

Table 15. Self-guided tour survey results

	Number of Student Responses	**Percentage of Student Responses**
How helpful did you find the tour? (n=37)		
I learned a lot	21	57%
I learned some new things	16	43%
I learned very little	0	0%
Now that you have completed the tour …		
do you feel more comfortable using Staley Library? (n=38)		

[6] These scores and the survey results represent participation by students in University Seminar and Honors University Seminar.

Yes	34	89%
No	1	3%
Not sure	3	8%
do you feel more confident about finding library resources? (n=38)		
Yes	32	84%
No	1	3%
Not sure	5	13%
do you know who to ask for help in the library? (n=38)		
Yes	37	97%
No	1	3%
Not sure	0	0%

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

Analysis of Assessment Results

Looking across all the different assessment types, CWRR 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 6%. In Part 2, they demonstrated an average 22% increase in correct answers on the multiple-choice portion and an average 11% increase in correct answers on the short answer questions. The HWS students showed a slight decrease in confidence in Part 1, a slight increase in the multiple-choice portion of Part 2, and a decrease in correct answers on the short answers.[7]

However, the participation rate for the HWS II sections was so low on the post-test that these numbers are not indicative of students' confidence or learning. Because we cannot require students to participate in the pre- and post-test assessment the percentage of responses typically declines on the post-test, and the respondents always exhibit a degree of self-selection. Last year we saw a sharp decline for both the CWRR and HWS sections on the post-test, and while the CWRR participation rate did go down, it did not decrease nearly as much as the HWS sections. All the HWS sections were taught online, and we can only hope that as we return to in-person instruction in the next academic year, the participation rate returns to something closer to its typical average.

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 CWRR on the multiple-choice portion of Part 2 the percentage of correct answers on the post-test was in the Excellent (Green) range at 81%. The percentage of correct answers on the short answer portion of Part 2 of the post-test also fell in the Excellent (Green) range at 87%. As in the past, students did particularly well on the question about databases (#4) with 84% correct and about citations (#8) also with 84% correct, while question 7 (sources) was the highest at 90% correct. Question 2 on keywords fell into the Adequate (Yellow) range at 66% correct. The students continued to show the greatest increase on questions related to material that the librarians particularly emphasize in their instruction sessions, e.g., the purpose of library subscription

[7] 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 $g < 0.3$. Applied to this year's assessment, for the selected response questions $g = .42$ (medium-g) and for the constructed response questions $g = .38$ (medium-g). These results are slightly lower than last year (.58 & .52).

databases and the credibility of different information sources (questions 4 and 7). On the whole this year's assessment shows that the 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. Students also showed a strong improvement in goal 4 (ethical aspects of information).

Analysis of Assessment Results for Part 1

CWRR students' self-assessed confidence increased on Part 1 by .18 points (6%) while HWS students showed a slight decrease (.07 points or 2%). CWRR students showed the greatest increase in confidence in finding resources in the library (question 7), knowing when the use of a source constitutes plagiarism (#15), knowing how to cite sources in the right format (#14) and finding articles in the library databases (#4). Students showed a slight decrease in defining their topic (#1) and knowing whether they have done a good job on an assignment (#16), and they showed no change in their confidence finding up-to-date materials (#8). Students had the highest overall scores on the post-test on questions 5 (finding sources out on the web) and 11 (reading and understanding the material).

Again, due to the low response rate from the HWS students on the post-test it is hard to draw conclusions about the change in their confidence in the research process from the pre-test to the post-test. However, if we look at the pre-test where the participation rate was higher, the honors students only showed a slightly higher average confidence on the pre-test (3.11 for the HWS students and 3.06 for CWRR), which is consistent with findings in the past. The honors students expressed higher confidence on the pre-test on question 11 on reading and understanding the material (3.82 vs. 3.50) and #12 on integrating sources into an assignment (3.52 vs. 3.26) but they expressed lower confidence on question 8 on finding up-to-date materials (2.88 vs. 3.11) and question 7 on figuring out where to find sources in the library (2.30 vs. 2.51). They also expressed lower confidence in knowing whether or not they have done a good job on an assignment (#16) and finding articles in a library database (#4). The HWS students identified reading and understanding the material (#11) as their highest confidence activity.

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 for both CWRR and HWS. This comparison shows that fewer CWRR students responded with 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. CWRR students showed an increase in their scores between the pre- and post-tests of 24%, which is smaller than last year's 46% increase. The average score on the post-test of 66% correct was the lowest on the post-test and falls in the Yellow range. For this question, as with the other skills questions in Part 2, the HWS students performed much better than the CWRR students. On the pre-test 89% of the HWS students

answered this question correctly. On the post-test, one of the two students answered this question correctly.

Question 4 on the type of resources available in library databases also showed a strong improvement (26%) between the two tests, and by the time of the post-test 84% of the CWRR students answered this question correctly, which is well into the Green range. 81% of the HWS students answered this question correctly on the pre-test and both of the students answered the question correctly on the post-test. Knowing what library databases are and how to search in them effectively are essential skills for scholarly researchers and a major focus of library instruction.

Question 6 asks students to narrow a given topic. The CWRR students showed a slight increase from the pre- to the post-test (4%), but the scores were already quite high on the pre-test with 78% correct. Here too the HWS students performed in the Green range on the pre-test and the post-test (85% correct and 100% correct).

Question 7 on information sources has in the past had much lower scores than the other questions in this section. This year, we made a change to this question and replaced the incorrect response "a survey conducted by the American Beverage Association" with a different incorrect response "a survey conducted by the Coca-Cola Company." While the CWRR score was low on the pre-test (63% correct), by the post-test 90% of the CWRR students answered this question correctly, which is a 44% increase and the highest of the multiple-choice questions. Perhaps students in the past were unfamiliar with a trade association such as the American Beverage Association, but with this change in the question they clearly identified the potential bias of a company performing a survey on the health benefits of their own products. The HWS students performed well on this question on the pre-test with 87% answering correctly.

Question 8, which asks about the best time in the research process to record a citation, also showed an increase in the CWRR students from pre- to post-test (17%), although the scores were relatively high on the pre-test (72% correct). The percentage correct (84%) on the post-test is well in the Green range and is similar to last year (88% correct). On this question as well, the HWS students scored higher with 87% answering correctly on the pre-test.

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. The CWRR students were most keen on learning how to find resources and how to navigate the library. A trend that we have seen for several years is that students are especially interested in learning how to be more efficient with their searching for resources (e.g., "What I would hope to learn from the library sessions is to be able to look for more reliable information more quikly [sic] and easier."). Many of the answers also revealed that students continue to associate the library with books and other print materials (e.g., "I am not sure what to expect honestly. My old school we always used online sources and books were extra credit.").

The HWS responses tend to be more detailed. These students said that using the library itself was the thing that they hoped to learn (e.g., "How to use the resources in the library to support my papers and not just rely on virtual sources." and "I hope to learn more about the layout of the library. I know each floor you go up, the quieter it gets, however I don't know much of where different types of literature are."). Like the CWRR students, they also placed an emphasis on finding resources efficiently (e.g., "How to find quick and relevant information from the library. How to use the least amount of time to find my sources.").

On the post-test the most valuable things the CWRR students claimed to have learned in their library instruction (question 1.1) were finding articles, i.e., using the databases, and navigating the library. Using the library databases to find scholarly articles has typically been the most popular answer to this question.

While a majority of students claimed that there was nothing more that they wish they would have learned in response to question 1.2, the next most popular answers were learning more about citation and learning even more about the library databases. Interestingly a few students specifically mentioned the limitations that COVID-19 placed on our library instruction and they expressed a wish that they could have done more in the library (e.g., "This one is really due to covid [sic], but finding and checking out books from the Staley library."). The complete range of answers to question 1 can be found in Tables 6, 7, 8, & 9 above.

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 work on methods for evaluating web sources. The CWRR students' average scores remained the same from the pre-test to the post-test (2.55), and their scores on the pre-test were already quite high (85% correct). For the HWS students on the pre-test their scores were also high (2.49 or 83% correct). Generally, the quality of responses to this question have increased over time, especially on the pre-test, which indicates that students are increasingly receiving instruction on evaluating websites prior to arriving at Millikin. Students do continue to demonstrate black and white thinking, especially on the pre-test, e.g., Wikipedia is always bad, and blogs can never be trusted. For this assessment cycle, some students claimed peer-review as an important criterion, which is not the case as peer-review does not apply to websites. This may indicate that students are still not clear on the distinction between a scholarly journal article and 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. The CWRR students' scores were 2.18 or 73% correct and increased by 22% to 2.66 or 89% correct by the post-test. This is a smaller than last year's increase of 37%, but the post-test score was substantially higher than last year's 2.40 or 80% correct. The HWS students started with 2.55 correct (85%), which is well into the Green range. As in past years, the students had a low opinion of newspapers and especially magazines and indicated that they all focus on gossip and celebrities (e.g., "1. Magazine articles are usually over exaggerated 2. Magazine articles are independent usually based on rumors 3. Scholarly journal articles require some form of research and accuracy"). By the time of the post-test, a number of students picked out peer-review as an important quality of scholarly articles (e.g., "Journal articles go through a peer review process which means other professionals in that area review it to make sure that not only the data is accurate, but also to make sure that the article is credible").

Question 9 was used for the second time in its current form. On the pre-test it focuses on students' prior information literacy experience while the post-test asks about their use of resources types during their first year at Millikin. As we found last year, between the CWRR and HWS students, the HWS students report more exposure to various aspects of information literacy instruction, but the percentage of the two groups' responses track closely, e.g., more students in both groups report knowing how to create citations than they do using a library catalog. This year the HWS students claimed less exposure to instruction in understanding the strengths and weaknesses of different information sources. The area where there was the largest discrepancy was in using library database where more than half of the HWS students claimed to have received instruction, while only 29% of the CWRR students had learned about library databases. For both groups, the topic they had received the least instruction on was using a library catalog at 16% for CWRR students and 20% for HWS students.

The post-test question 9 asks students to identify the information sources they used in any of their classes in their first year at Millikin. 94% of the CWRR students claimed to have used websites and 92% said they used scholarly journals. Only 23% said they used encyclopedias or dictionaries, and only 39% said that they used paper books. Interestingly that percentage is higher than the 24% who claimed to have used paper books last year. This question on both the pre- and post-test helps the librarians to better understand the information literacy that students being to Millikin and the types of resources they are using while they are at Millikin.

Analysis of Results for the Self-Guided Tour

There were 38 unique responses to the optional survey that students complete after taking the self-guided tour, which represents approximately 24% of the 160 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 (84%), and more knowledgeable about who to ask for help in the library (97%). More than half of the students (57%) claimed that they learned a lot through the virtual tour while 43% claimed to have learned some new things. All of the results from the survey can be seen in Table 15 (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 students were asked to complete a worksheet after working through the library's virtual tour. 160 worksheets were submitted, and the average score was 8.7 (median = 9) out of 10. Based on a class of 409 this means that approximately 39% of first year students completed the self-guided tour (the results are in Table 14 above).

Overall, the virtual tour accomplished its purpose of introducing students to the physical library and its services, but the participation rate was much lower than last year when we held an in-person tour (72% participation rate). We hope to return to an in-person tour in the fall and to subsequently see the participation rate increase.

Analysis of Assessment Results for Off-Sequence CWRR classes

This year data were collected from four off-sequence CWRR II sections in fall 2020. These classes were small (44 students across the four sections), and the participations rate was only 9% (4 students). In addition to the low participation rate, assessing the off-sequence classes always presents challenges since these sections are populated with 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 the class for a second time.

For part 1 of the assessment, the overall confidence for the off-sequence CWRR classes was lower on the post-test than for the CWRR classes (2.92 versus 3.24), which is consistent with past years. In Part 2 of the assessment, the overall average percentage who answered the questions correctly on the multiple-choice questions was lower in the off-sequence sections (75% correct vs. 81% correct for the traditional CWRR classes). For question 3 (website evaluation) the off-sequence scores were much lower than the traditional CWRR classes (1.88 versus 2.55) while they were closer but still lower for question 5 (2.38 versus 2.66). As with the traditional CWRR classes, the most popular response to question 1 was finding articles using the library databases as the most valuable thing that they learned. The results for question 9 were also similar, although a higher percentage of students in the off-sequence classes claimed to have used paper books in their first year at Millikin University.

The complete results for the off-sequence CWRR classes can be found in Appendix C (below).

Improvement Plan

This year was only second time that we separated the assessment of the CWRR and the HWS students, and once again the poor participation rate on the post-test for the HWS students rendered the data essentially meaningless. While 93% of the HWS students completed the pre-test, only 5% of the students completed the post-test. Nonetheless, the results from the pre-test revealed interesting insights. While the honors students performing better on the skills portion of the assessment is not surprising, the parity of their confidence in many elements of the research process with their CWRR peers is telling. If we can generate

more reliable data for the post-test in the future, it will be interesting to see how that confidence changes over the students' first year at Millikin.

The low participation rate on the self-guided tour this year was disappointing, especially when compared to the very high participation rate we typically see with our in-person tour. However, those who completed the tour and the survey did indicate that the tour met its intended learning goals. If the trajectory of increased in-person instruction continues to the fall, we should be able to return to a physical tour of the library for the fall semester. Getting students physically into the building and experiencing our services and collections will help to give students a better sense of navigating the library, which is something that some students indicated that they wanted to learn when asked on this year's post-test.

The changes to question 7, which identifies a peer-reviewed journal article as an objective and accurate source of information on the health benefits and drawbacks of energy drinks, was modified this year, as discussed above, in the hope of bringing the scores more in line with the other questions on this part of the assessment. That goal was achieved, and students also showed a large increase in the percentage of correct scores from the pre-test to the post-test, which reflects positively on our instruction. This year, that question will need to be modified again slightly as one of the incorrect answers, "A discussion of energy drinks on Yahoo! Answers" references a service that has been discontinued.

For the past several years, the librarians have been moving away from a checklist approach to website evaluation to one that better addresses today's more complex online information landscape that encompasses much more than static webpages. In doing so we are following best practices in information literacy instruction.[8] However, question 3 on Part 2 of the assessment addresses website evaluation in a manner that is largely predicated on a checklist approach. The librarians need to discuss how to modify this question to better match the instruction that we are providing students on how to evaluate all different types of online sources.

Conclusion

On the whole, the assessment of library instruction in University Seminar/CWRR/HWS indicates that students are learning important information literacy skills and increasing their confidence in the research process 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 the first year University Studies sequence the opportunity to meet with classes on several occasions allows the librarians to introduce and then reinforce concepts with the students. The library faculty are excited to return to the classroom for the 2021-2022 academic year and to work with students face to face. They also look forward to working again with their CWRR, HWS, and Seminar colleagues to make our students more information literate.

[8] Many articles have appeared in the library literature in the past few years discussing the need to move beyond checklists, like the CRAAP test, for evaluating websites, for example Fielding, J.A. Rethinking CRAAP : Getting students thinking like fact checkers in evaluating web sources. *College & Research Libraries News, 80*(11), 620. doi:https://doi.org/10.5860/crln.80.11.620

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 Coca-Cola Company.

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. (Pre-Test) Prior to coming to Millikin University did you receive instruction in any of the following areas? (check all that apply)
   Understanding the strengths and weaknesses of different information sources
   Using library databases (Gale, EbscoHost, etc.)
   Using a library catalog
   Developing keywords to use in your searches
   Evaluating websites
   Creating MLA, APA, Chicago, etc. style citations

9. (Post-Test) Which of the following information sources have you used for assignments in any of your classes during your first year at Millikin University? (check all that apply)
   Paper books
   E-books
   Encyclopedias or dictionaries
   Scholarly journals
   Newspapers or magazines
   Websites

Categories for Part 2, Question 1

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

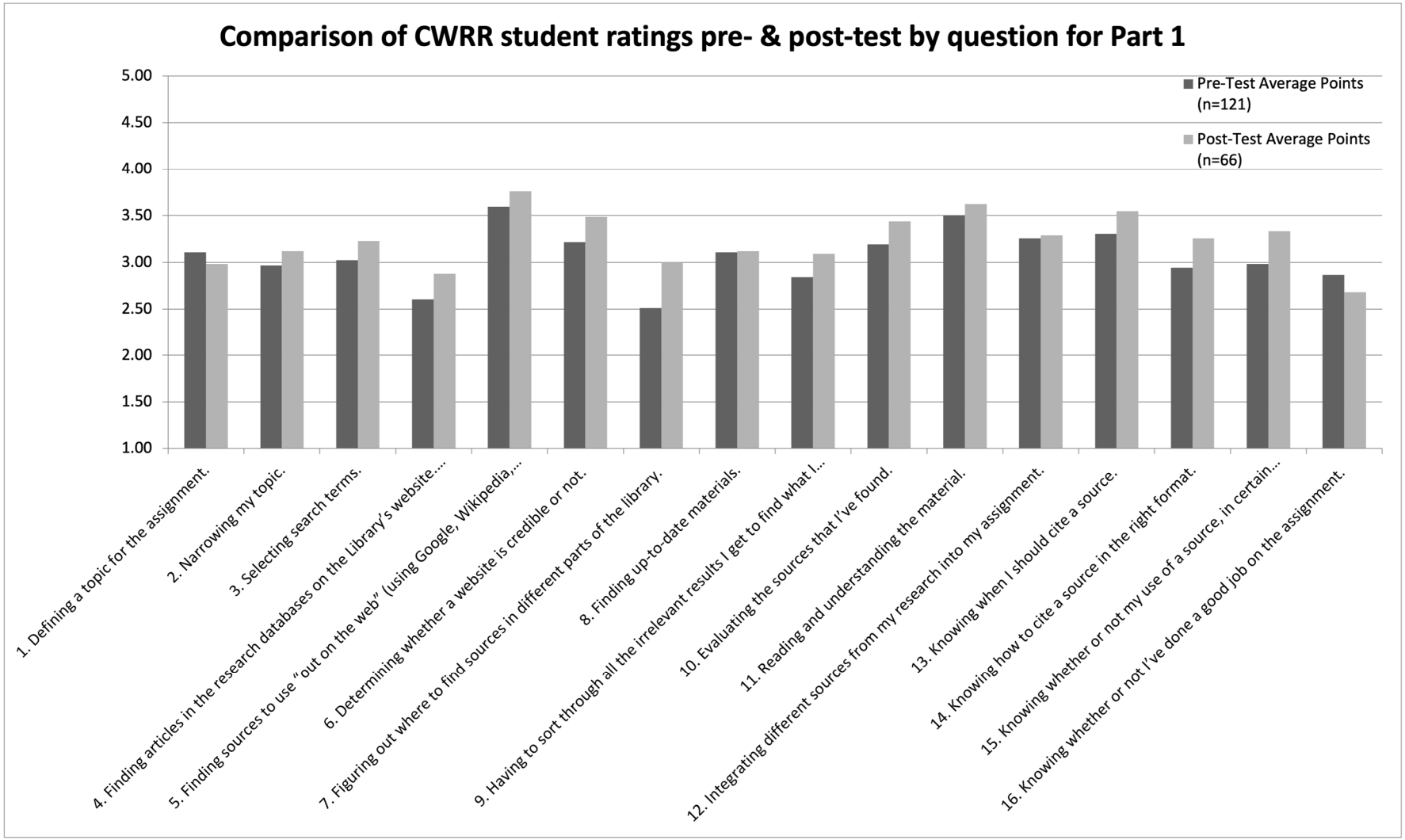
2 = Two differences correctly identified

3 = Three differences correctly identified

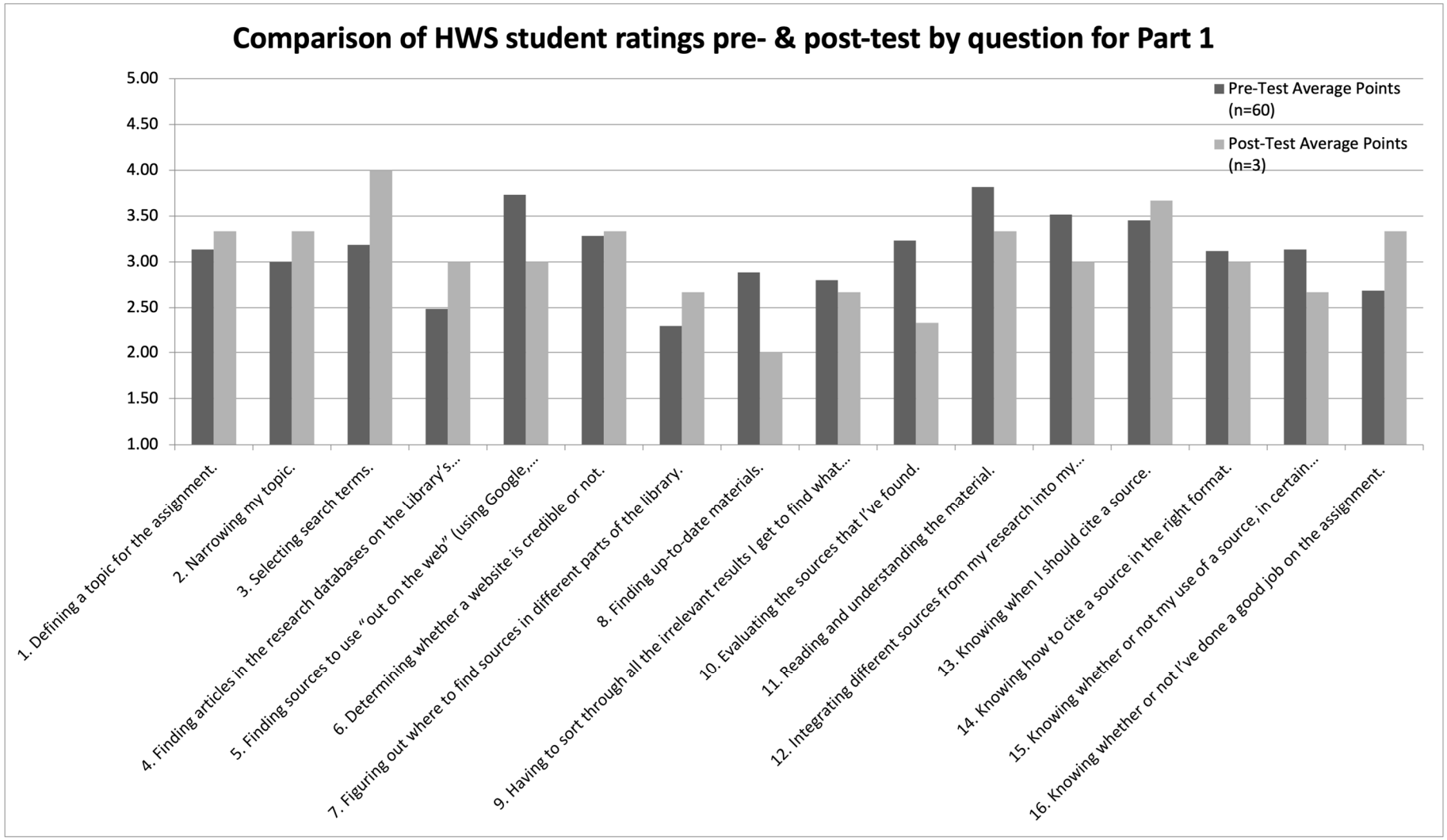
Appendix B

Graphical Representation of Pre- and Post-Test Results

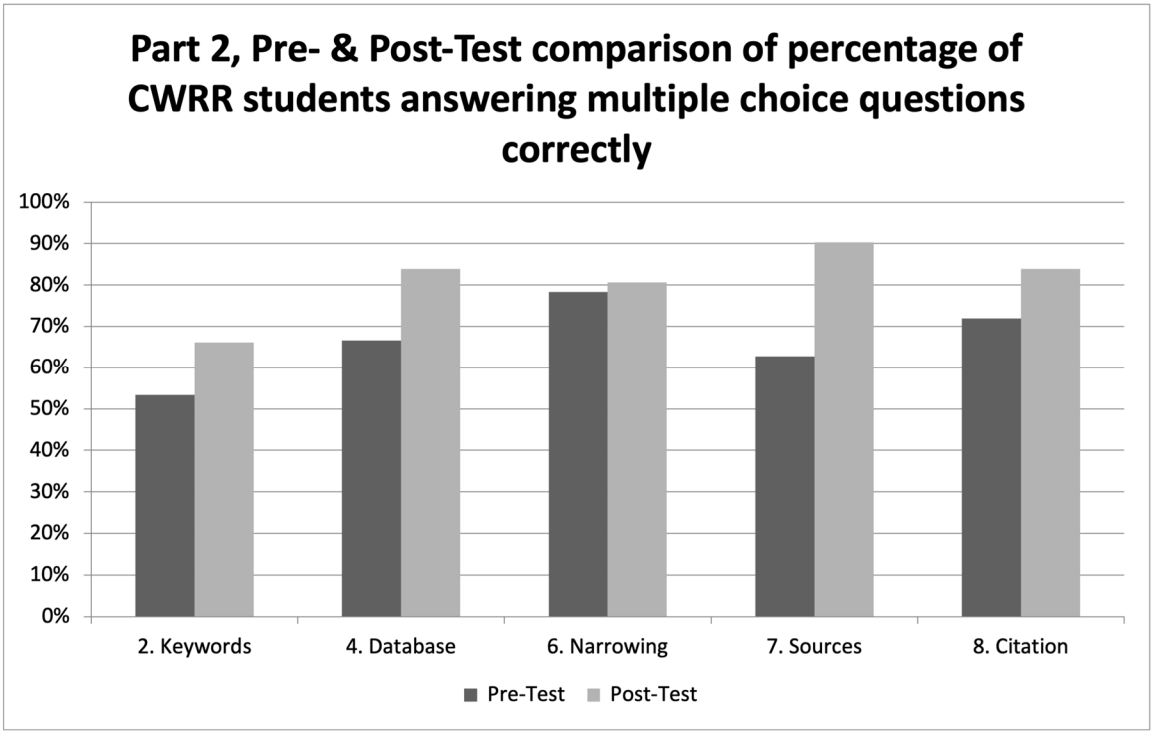
Graph 1


Comparison of CWRR 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 (n=121)
Post-Test Average Points (n=66)
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....
5. Finding sources to use "out on the web" (using Google, Wikipedia,...
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...
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...
16. Knowing whether or not I've done a good job on the assignment.

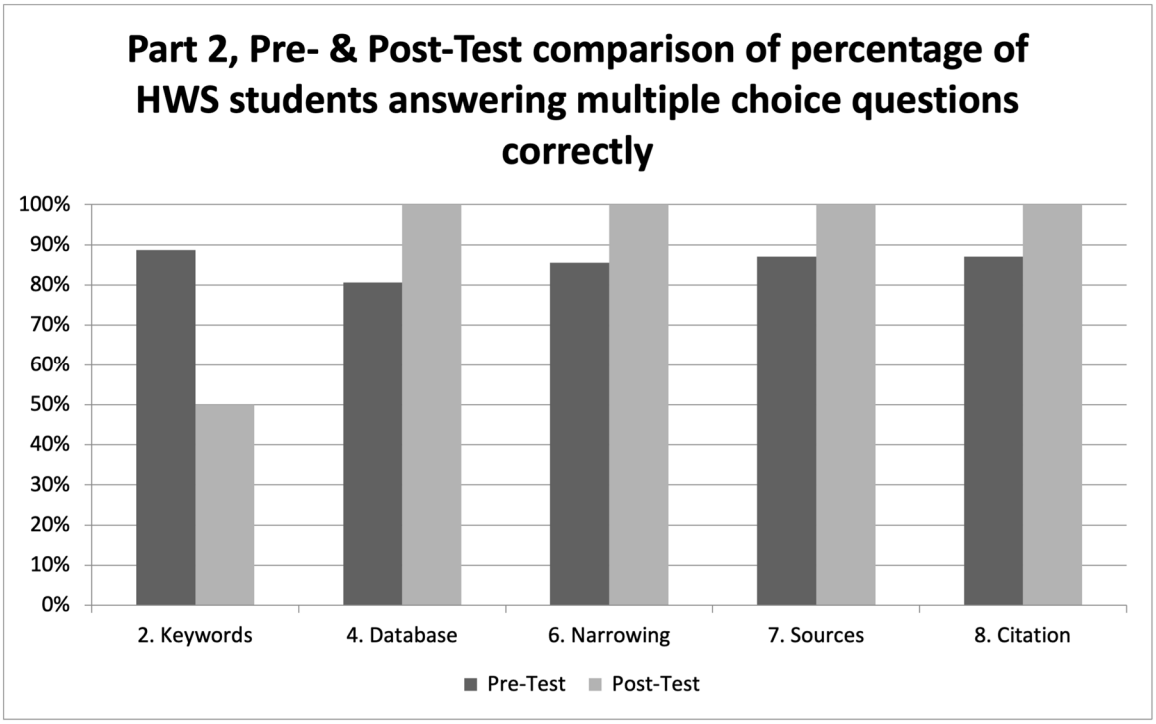
Graph 2


Comparison of HWS 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 (n=60)
Post-Test Average Points (n=3)
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.

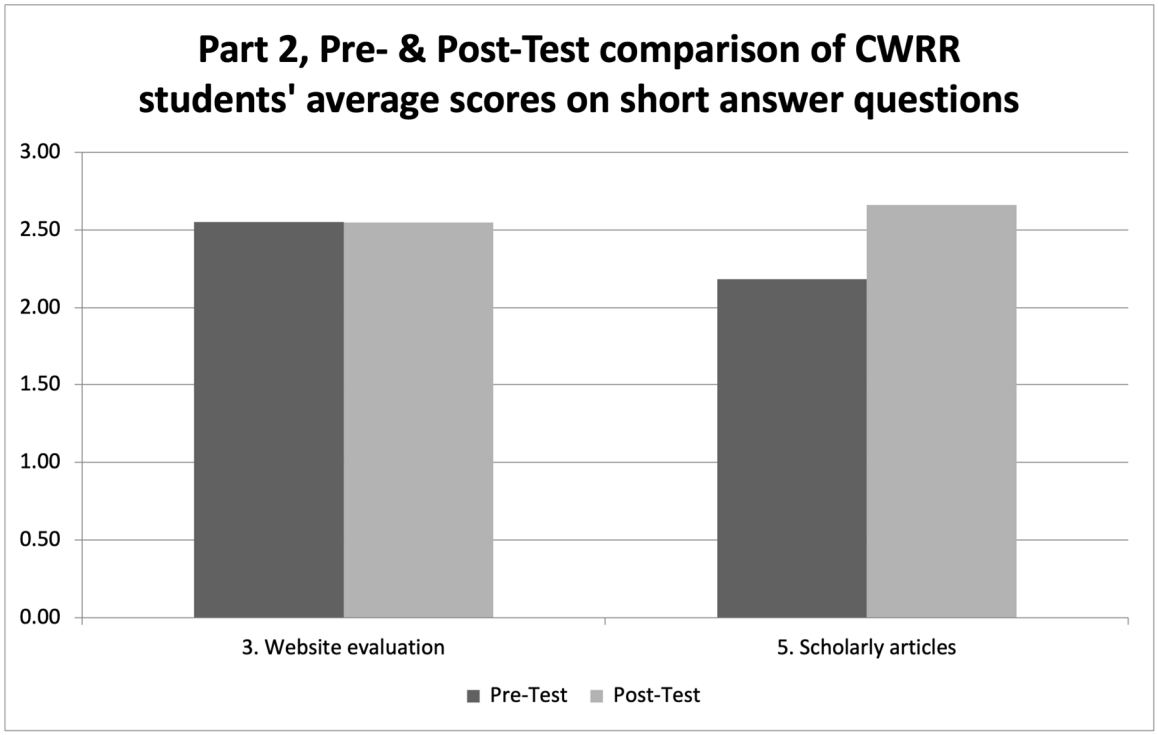
Graph 3



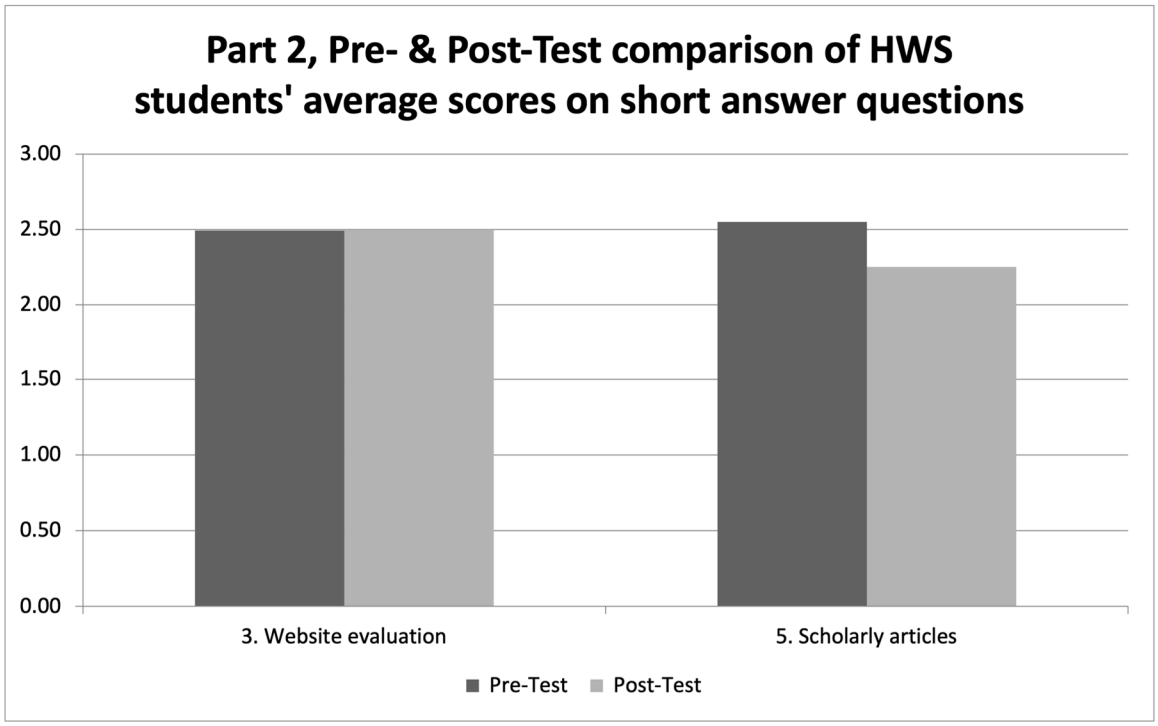
Graph 4



Graph 5



Graph 6



Appendix C

Off-Sequence CWRR Results[9]

Part 1

Table 1. Student ratings by question for Part 1

Question **Scale 1 - 5** **1 = very difficult** **5 = very easy**	**Post-Test Average Points** (n=4)
1. Defining a topic for the assignment	3.00
2. Narrowing my topic	3.25
3. Selecting search terms	2.75
4. Finding articles in the research databases on the Library's website (EBSCO, JSTOR, ProQuest, etc.)	2.75
5. Finding sources to use "out on the web" (example - Google, Wikipedia, websites)	3.25
6. Determining whether a website is credible or not	3.00
7. Figuring out where to find sources in different parts of the library	2.75
8. Finding up-to-date materials	3.25
9. Having to sort through all the irrelevant results I get to find what I need	2.25
10. Evaluating the sources that I've found	2.75
11. Reading and understanding the material	3.00
12. Integrating different sources from my research into my assignment	3.00
13. Knowing when I should cite a source	3.25
14. Knowing how to cite a source in the right format	3.00
15. Knowing whether or not my use of a source, in certain circumstances, constitutes plagiarism	3.00
16. Knowing whether or not I've done a good job on the assignment	2.50
Average	**2.92**

[9] The off-sequence results represent four section of CWRR II in fall 2020.

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

Rating	**Post-Test** (n=4)
1 – This is very difficult	2%
2 – This is difficult	30%
3 – This is neutral	50%
4 – This is easy	13%
5 – This is very easy	6%

Part 2

Table 3. Pre-test percentage of students answering multiple-choice questions correctly

Multiple-Choice Question	**Post-Test** (n=4)
2. Keywords	25%
4. Database	100%
6. Narrowing	75%
7. Sources	75%
8. Citation	100%
Average	**75%**

Table 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 sessions?"	**Number of Student Responses** (n=4)	**Post-Test Question 1.2 – "What do you wish that you would have learned?"**	**Number of Student Responses** (n=4)
Finding articles – "How to use the database to search on different database platforms."	2	**Nothing** – "There is nothing I wish I would have learned."	2
Library – "it's easy to use the library"	2	**Citation** – "When to site sources."	1
		Don't know – "what's the need for a library when everything you need is online now "	1

Table 5. Student scores on the 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."	**Post-Test** (n=4)
Average (out of 3)	**1.88 (63%)**

Table 6. Student scores on the 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=4)
Average (out of 3)	**2.38 (79%)**

Table 7. Student responses to post-test question 9

Post-Test Question 9 – "Which of the following information sources have you used for assignments in any of your classes during your first year at Millikin University? (check all that apply)"	**Number of Student Responses** (n=4)	**Percent of Student Responses**
Paper books	3	75%
E-books	3	75%
Encyclopedias or dictionaries	1	25%
Scholarly journals	3	75%
Newspapers or magazines	2	50%
Websites	4	100%