Annual Assessment Report
Strategic Thinking for Research in First Year Writing Students
DePaul Library

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Part I: Follow-Up on Last Assessment Report Recommendations

The recommendations and action plans presented in the Library's 2015/2016 Annual Assessment Report were written with the expectation that the School for New Learning (SNL) would launch a new competency based program in the 2017/2018 academic year. Given that the University did not grant permission for SNL to move forward with the new program, the Library will not be implementing many of the recommendations and plans for additional research discussed in the report, especially those related to the proposed Research Writing and Research Methods courses. The Library will continue to provide the same level of support to current SNL students who still need to pass the Research Seminar (LL 300) course in order to complete their bachelor degrees. And we will apply what we learned from this assessment project to the other classes we support, both in person and online.

The results of the assessment project were shared with DePaul faculty, staff and library colleagues. The report was sent to SNL's Research Seminar Champion, Dr. Kevin Downing, to be shared with LL 300 instructors. Jessica Alverson, Jennifer Schwartz and Susan Shultz presented the assessment results to several of our stakeholder groups at the following meetings: DePaul's 2017 Teaching and Learning Conference; the May 2017 Co-Curricular Learning Assessment Committee; the May 2017 Illinois Information Literacy Summit; the Fall 2016 meeting of Chicago Distance Librarian's Group; and the 2016 DePaul Librarian Instruction Workshop.

As the School for New Learning moves forward with new program development, the library remains committed to supporting the academic success of their students. We look forward to the possibility of applying our assessment findings to future research courses developed by SNL.

Part II: Report on This Year's Assessment Project

Abstract

In collaboration with the department of Writing, Rhetoric, and Discourse (WRD), the Library provides research instruction to students in the First-Year Writing Program. Librarians meet with each section of WRD 104 to teach a 90-minute instruction session focusing on critical research skills, finding and evaluating sources, and developing a research strategy.

For this assessment project, we investigated whether our teaching materials effectively target the strategic thinking skills that students need at the beginning of their research. In order to evaluate the learning outcome "Strategize," we collected and analyzed a worksheet students complete before attending their library instruction session. The worksheet is accompanied by an online tutorial and guides students through exploring and developing their research topic. During Winter Quarter 2017, we collected 136 worksheets from twelve sections of WRD 104 and analyzed the worksheets using an original rubric.

Our results indicated that 71% of students achieved an overall score of acceptable or better on the worksheet, and we concluded that our teaching materials are successfully helping students meet our learning outcome. We also analyzed each section of the worksheet to see where we might provide students with additional support in this process, including a correlation analysis which revealed that the technique students choose to explore their topic impacts their overall performance on the worksheet. Based on our findings, we made several changes to our teaching materials to further emphasize the strategic thinking skills we want students to learn from the library instruction session.

Learning Outcome Assessed

The Library assessed the learning outcome **"Strategize,"** which addresses the skills students need at the beginning stages of a research project. The learning outcome states:
Students will be able to identify gaps in their current knowledge in order to determine the data, evidence, and diverse viewpoints needed to support their research and learning goals.

Data Collection and Methodology

Assessment this year focused on our collaborative work with the Writing, Rhetoric, and Discourse department, specifically with WRD 104, a required first year writing class. The Library

leads a 90-minute instruction session with these students during the quarter, teaching critical research skills, how to find and evaluate sources, and how to strategize about research.

Since we chose to assess the skills students need at the beginning stages of research, we examined a worksheet students complete (Appendix A) in conjunction with an online tutorial designed by our e-learning librarian, "Developing a Research Question," http://tutorials.library.depaul.edu/e-learning/developing-a-research-question. Students are asked to finish these before class and bring them to the library instruction.

The worksheets have four questions. First, students are asked to write their general research topic. Second, they complete a topic exploration exercise (explained in the online tutorial) that includes different aspects and/or viewpoints related to their chosen topic. Third, students refine their original topic into a research question. And fourth, students list two things that they need to learn more about in order to write their paper.

During Winter Quarter 2017, four librarian co-investigators collected and analyzed the "Developing a Research Question" worksheets from students in 12 sections of WRD 104. A total of 136 worksheets were collected, for a participation rate of approximately 45.3%.[1] Student participation was voluntary.

The research team analyzed the worksheet using an original rubric we created for this project (Appendix B). Our rubric was inspired by the research conducted by Rinto, Bowles-Terry & Santos, detailed in their article, "Assessing the Scope and Feasibility of First-Year Students' Research Paper Topics."[2]

Worksheets were scored on the following four criteria using a three-point scale.

1. Exploration exercise includes diverse aspects of the topic of interest
    - Students complete an exploration of their topic, choosing between Free Writing, Mind Mapping, or the 5 Ws. The student should include at least three diverse concepts related to the initial topic.
2. Topic of interest is developed into a preliminary research question
    - Students are asked to draw on their exploration exercise to create a research question. The student should use the concepts from the exploration exercise to create a research question.

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[1] WRD 104 sections are generally capped at 25 students.

[2] Rinto, E., Bowles-Terry, M., & Santos, A. J. (2017). Assessing the Scope and Feasibility of First-Year Students' Research Paper Topics. *College & Research Libraries*, *77*(6).

3. Preliminary research question is researchable
    - The question shouldn't be too broad or too narrow and there should be a variety of resources available on the topic for the student to consult.
4. Response to reflection question demonstrates understanding of gaps in knowledge.
    - Students should identify two examples of information needed for their research.

A score of 1 is considered "beginning," 2 is "meets expectations," and 3 is "exemplary." For this assessment project, scoring a 2 or 3 would be considered acceptable or better performance in meeting our learning outcome.

Our group met several times to norm the data, working through discrepancies and adding clarifying comments to our rubric for better inter-rater reliability. After coming to a consensus about the scoring, we divided the de-identified 136 worksheets among the four of us and scored them independently.

We averaged the overall scores to determine how many students met the threshold of success. We then performed a correlation analysis to determine if success in one portion of the worksheet was related to success in another portion of the worksheet. And finally, we looked closely at the scores for each individual criterion on our rubric to see where students were succeeding or struggling.

Results

In determining whether students had successfully met our learning outcomes, we averaged the score for the four criteria. 2 and above is considered to be acceptable or better performance. Based on the average of the four criteria, 97 students (71%) achieved acceptable or better performance. The overall average score was 2.20.

Learning Outcome	**# Students Assessed**	**# Students with Acceptable or Better Performance**
Strategize: Identify gaps in their current knowledge in order to determine the data, evidence, and diverse viewpoints needed to support their research and learning goals.	136	97

In addition to determining how well students did overall, we hoped to examine different aspects of the worksheet to see where we might provide students with additional support in this process. Grading each criterion separately, we found the following results (Appendix C):

- Criterion 1. Exploration exercise includes diverse aspects of the topic of interest. 94% (n=128) were successful. The average score was 2.46. 53% (n=72) scored a 3.
- Criterion 2. Topic of interest is developed into a preliminary research question. 79% (n=107) were successful. The average score was 2.08. 30% (n=41) scored a 3.
- Criterion 3. Preliminary research question is researchable. 82% (n=111) were successful. The average score was 2.09. 28% (n=38) scored a 3.
- Criterion 4. Response to reflection question demonstrates understanding of gaps in knowledge. 82% (n=111) were successful. The average score was 2.17. 43% (n=58) scored a 3.

A correlation analysis of all 136 worksheets reflects the strongest correlation between criterion 2 and 3; +0.56 indicating a moderate (positive) relationship. The next strongest correlation was between criterion 1 and 2; +0.50 indicating a moderate (positive) relationship (Appendix D, Table 1).

The correlation analysis of all 136 worksheets, and of each of the three techniques, only revealed one strong correlation (Appendix D). This was between criteria 1 and 2 on worksheets using the Mind Mapping technique. This reflects that students who used Mind Mapping for question 2 on the worksheet, and scored high on criterion 1, tended to develop a better preliminary research question and thus scored higher on criterion 2 than students using the other exploration exercise techniques.

Interpretation of Results

Based on our results, the “Developing a Research Question" worksheet is successfully helping the majority of students identify gaps in their current knowledge in order to determine the data, evidence, and diverse viewpoints needed to support their research and learning goals. 71% achieved acceptable or better performance on their worksheets with an average score of 2.20.

Students were most successful in fulfilling criterion 1 of the rubric -- including diverse aspects of the topic in the exploration exercise -- with 94% receiving a grade of 2 or 3, with an average score of 2.46. They were less successful in fulfilling the other three criteria. Criterion 2 -- developing the topic into a research question -- had the lowest average score of 2.08, followed

by criterion 3 -- the question is researchable -- with an average score of 2.09. Students did better with criterion 4 -- identifying knowledge gaps -- with an average score of 2.17. (Average scores are available in Appendix C, Table 1)

The aspect of the worksheet that students seemed to struggle with the most was developing a good preliminary research question that's researchable. While 79% of the students were successful in developing a preliminary research question that meets or exceeds expectations, and 82% had a research question that was researchable; only 30% had an exemplary research question, and 28% achieved exemplary for their question being researchable. However, they did better with their understanding of gaps in knowledge. 82% successfully met this particular criterion, with 43% achieving exemplary. This component of the worksheet was recently added and the students seemed to benefit from it. (Percentage of Successful Students are available in Appendix C, Table 2; Percentage of Exemplary Students are available in Appendix C, Table 3)

The technique that students chose for the exploration exercise impacted how well they did overall on the worksheet. Students who utilized the 5W's and Mind Mapping techniques performed significantly better than those who used Free Writing. They also tended to score higher on each of the individual criteria. Students who used the Free Writing technique didn't provide as many diverse concepts and subtopics in the exploration exercise as students who used the other two techniques. This seemed to impact their performance on the rest of the worksheet.

Students who used Mind Mapping had the highest overall scores, with an average of 2.32. They did exceptionally well on the exploration exercise with an average score of 2.64 (Appendix C, Table 1). The success rate for this particular criterion was 100% of which 64% were exemplary (Appendix C, Table 2). This success translated into a significantly better preliminary research question when compared to the worksheets where students used the 5W's or Free Writing techniques.

45% of the students using Mind Mapping had an exemplary research question (Appendix C, Table 3). The strength of the connection between the exploration exercise and the research question is reflected by the results of the correlation analysis. Criteria 1 and 2 have a correlation of +0.75 (Appendix D, Table 3). These students also scored highest on having a researchable question with 41% achieving exemplary, and in their understanding of gaps in knowledge with 50% achieving exemplary (Appendix C, Table 3).

Students who chose Free Writing as their exploration exercise technique didn't do quite as well. The average overall score was 2.02. The average score for the exploration exercise was 2.24.

The success rate for this criterion was 84% of which 44% were exemplary. Only 24% had an exemplary research question and 16% achieved exemplary for researchability. The average scores for both criteria were 1.92 and 1.96, respectively (Appendix C).

Overall, we are very satisfied with the results. While students are not always ready to write a fully developed research question when we see them in the library (typically during the 3rd or 4th week of the quarter), the students in this study were able to recognize diverse aspects and viewpoints in their topic explorations, and were able to identify data and information that they needed to learn more about.

Recommendations and Plans for Action

Based on findings from our assessment project, we decided to make several immediate changes to the Developing a Research Question worksheet that students complete prior to their library instruction session (Revised Worksheet, Appendix E):

1. As part of the assessment project, we added a new question to the worksheet for the duration of the study: "What do you need to learn more about in order to answer your research question?" This question proved highly effective at getting students to identify specific gaps in their knowledge. In Autumn Quarter 2017, this question will be added to the worksheet for all WRD 104 sections.

2. We previously intended for students to reach the end of the worksheet having developed a strong preliminary research question. However, we learned that many students are not ready to identify a research question at this stage of their research process. Instead, we will shift the focus of the worksheet to emphasize flexibility and strategic thinking around a topic. Effective Autumn Quarter 2017, we have reordered the questions and asked students to identify gaps in their knowledge immediately following the topic exploration activity. Our final question will ask students to incorporate ideas from the exploration activity and develop two to three possible research questions they could investigate (instead of articulating a single preliminary research question).

3. Our results also indicated a correlation between students who used either the Mind Mapping or 5Ws technique to complete the topic exploration activity and higher overall success on the worksheet. Since using the Free Writing technique correlated with a lower rate of success, we will consider removing this option from the worksheet altogether. This change will require additional time to implement, as the online tutorial

would need to be updated. We also noted that students were less likely to choose the Mind Mapping technique (probably due to difficulties creating a Mind Map when doing the assignment online), and we are considering ways to make Mind Mapping easier for students to try. These changes will be discussed during Winter Quarter 2018 for possible implementation by Fall Quarter 2018.

We believe these changes to the Developing a Research Question tutorial and worksheet will contribute to an improved learning experience for students that will help them meet our learning outcome of "Strategize."

We shared the results of our study with WRD 104 faculty and instruction librarians before the start of Autumn Quarter 2017, discussing our rationale for these changes to the tutorial and worksheet. We hope this leads to further collaboration with WRD 104 faculty that will allow us to align our approach to teaching topic development during library instruction with their teaching strategies, both during library instruction as well as in their classes.

We also plan to use this study to launch an ongoing assessment of our WRD 104/HON 100 instruction program. Since instruction for these classes is the foundation of the Library's information literacy instruction program, we want to ensure that our learning goals are being met and that updates are regularly implemented. During the upcoming year, at least one member of our assessment team will liaise with the Library's Instruction Working Group to devise a strategy for assessing the impact of our changes to the Developing a Research Question worksheet, as we continue to assess the WRD 104/HON 100 library instruction curriculum over the next year.

Finally, additional data was collected for the project that we may consider using for further investigation, including mining and analyzing the text from student topics, research questions, and gaps in knowledge. Projects using this data could help inform our understanding of the kinds of topics students choose and the terms and vocabulary that students identify as relevant.

Appendix A: Developing a Research Question Worksheet

Developing a Research Question

Instructions: After watching the Developing a Research Question tutorial, complete the following 4 questions.

1. **My topic of interest**: _____

2. **Use one of the techniques from the tutorial (free writing, 5Ws, or mind mapping) to explore your topic.**

5Ws: answer the following questions ***Who*** *does your topic impact? Who cares about your topic?* ***What*** *is influenced by or influences your topic?* ***When*** *was or is your topic relevant?* ***Where*** *is your topic relevant?* ***Why*** *is your topic important?*	**Free writing:** *write continuously for a set amount of time. Ignore grammar and spelling. Write what you know and identify gaps and questions to pursue.* **Mind mapping***: a visual form of brainstorming. Include related subtopics, concepts and words and connect to them to your topic.*

3. **My preliminary research question**:

TIP: *Your research question should be more formed than your initial topic of interest. Use your free writing, 5Ws, or mind map to help you formulate your research question*.

4. **On the other side of this paper, please answer the following:**
   Based on your exploration of this topic so far, what do you need to learn more about in order to answer your research question? Write down at least two aspects of your topic that need further research.

Appendix B: Rubric

Rubric for analyzing topic development worksheets

	Exemplary	Meets Expectations	Beginning
1. Exploration exercise includes diverse aspects of the topic of interest	Many diverse concepts and subtopics are represented, including who is affected, what aspects of the topic can be explored, when the topic was relevant, or where the issue is present. Includes 6 or more diverse concepts with 3 or more W's present.	A number of diverse concepts and subtopics are represented, but further development is required. Student may be missing one or more topics covering who, what, when or where. Includes at least 3 diverse concepts with at least 2 W's present.	Very few diverse concepts or subtopics are represented, and extensive development is required. Student does not specifically define various aspects of their topic, including who, what, when or where. Includes fewer than 3 diverse concepts or fewer than 2 W's.
2. Topic of interest is developed into a preliminary research question	Preliminary research question incorporates at least two concepts or subtopics from the exploration exercise.	Preliminary research question incorporates at least one concept or subtopic from the exploration exercise.	Preliminary research question doesn't include any concepts from the exploration exercise.
3. Preliminary research question is researchable (is there material about the topic?)	Research question is able to be challenged, examined, or analyzed by a novice researcher with a variety of readily available resources (both scholarly and popular) in a feasible amount of time.	Research question is able to be challenged, examined, or analyzed by a novice researcher, but there are potential issues around feasibility or access of information resources. There may be too much or too little information available on this topic, only one kind of source that addresses this topic (i.e. only popular), or other issues with time and access.	Research question is not researchable because the topic cannot be challenged, examined, or analyzed by resources readily available to a novice researcher in a feasible amount of time.
4. Response to reflection question demonstrates understanding of gaps in knowledge	Two or more gaps in knowledge are identified and are tied to concepts in the exploration exercise or preliminary research question.	At least one gap in knowledge is identified and tied to concepts in the exploration exercise or preliminary research question.	Gaps in knowledge are not identified or are not tied to concepts in the exploration exercise or preliminary research question.

Notes:

- Score of 2 or 3 indicates satisfactory completion of the exercise. Most students should be working at a level of "2". Score of 3 indicates exemplary work.
- Score of "0" indicates that question was not answered

Appendix C: Results

Table 1: Criteria Average Scores

	5W's (n= 89)	Mind Mapping (n=22)	Free Writing (n=25)	All Techniques (n=136)
Criterion 1	2.48	2.64	2.24	2.46
Criterion 2	2.07	2.32	1.92	2.08
Criterion 3	2.10	2.18	1.96	2.09
Criterion 4	2.24	2.14	1.96	2.17
All Criteria	2.22	2.32	2.02	2.20

Table 2: Criteria Success Rates (%)

	5W's (n= 89)	Mind Mapping (n=22)	Free Writing (n=25)	All Techniques (n=136)
Criterion 1	96% (n=85)	100% (n=22)	84% (n=21)	94% (n=128)
Criterion 2	79% (n=70)	86% (n=19)	72% (n=18)	79% (n=107)
Criterion 3	83% (n=74)	77% (n=17)	80% (n=20)	82% (n=111)
Criterion 4	85% (n=76)	77% (n=17)	72% (n=18)	82% (n=111)
All Criteria	74% (n=66)	73% (n=16)	60% (n=15)	71% (n=97)

Table 3: Criteria Exemplary Rates (%)

	5W's (n= 89)	**Mind Mapping (n=22)**	**Free Writing (n=25)**	**All Techniques (n=136)**
Criterion 1	53% (n=47)	64% (n=14)	44% (n=11)	53% (n=72)
Criterion 2	29% (n=26)	45% (n=10)	24% (n=6)	30% (n=41)
Criterion 3	28% (n=25)	41% (n=9)	16% (n=4)	28% (n=38)
Criterion 4	44% (n=39)	50% (n=11)	36% (n=9)	43% (n=58)
All Criteria	11% (n=10)	32% (n=7)	4% (n=1)	13% (n=18)

Appendix D: Rubric Correlation Analysis

Table 1: All Techniques (n=136)

	Criterion 1	*Criterion 2*	*Criterion 3*	*Criterion 4*
Criterion 1	1			
Criterion 2	0.498509	1		
Criterion 3	0.261194	0.555150	1	
Criterion 4	0.183870	0.152394	0.244681	1

Table 2: 5W's (n=89)

	Criterion 1	*Criterion 2*	*Criterion 3*	*Criterion 4*
Criterion 1	1			
Criterion 2	0.424514	1		
Criterion 3	0.326677	0.656713	1	
Criterion 4	0.158273	0.102761	0.232404	1

Table 3: Mind Mapping (n=22)

	Criterion 1	*Criterion 2*	*Criterion 3*	*Criterion 4*
Criterion 1	1			
Criterion 2	0.748819	1		
Criterion 3	0.541908	0.562595	1	
Criterion 4	0.454999	0.371432	0.246568	1

Table 4: Free Writing (n=25)

	Criterion 1	*Criterion 2*	*Criterion 3*	*Criterion 4*
Criterion 1	1			
Criterion 2	0.523586	1		
Criterion 3	-0.144487	0.161165	1	
Criterion 4	0.060991	0.096561	0.264801	1

Appendix E: Revised Developing a Research Question Worksheet

Developing a Research Question

Instructions: Complete after watching the "Developing a Research Question" tutorial: http://tutorials.library.depaul.edu/e-learning/developing-a-research-question/story_html5.html

1. **My topic of interest**: _____

2. **Topic Exploration.** In the space below, use one of the techniques from the tutorial (free writing, 5Ws, or mind mapping) to explore your topic.

3. **Identify Knowledge Gaps**. Based on your exploration of this topic so far, what do you need to learn more about in order to develop a research question? Write down two aspects of your topic that need further research.

   a. _____

   _____

   b. _____

   _____

4. **Preliminary Research Question.** What are three possible research questions you could explore? Circle the keywords in these questions that you might use in your search for resources.

   a. _____

   _____

   b. _____

   _____

   c. _____

   _____