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All the World's a Laboratory: Inquiry-Based Learning Experiments in the First Year Seminar Research Lab

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ALL THE WORLD'S A LABORATORY: INQUIRY-BASED LEARNING EXPERIMENTS IN THE FIRST YEAR SEMINAR RESEARCH LAB

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BACKGROUND

Wheaton College is a liberal arts school with about 1600 students located in Norton, MA. At Wheaton, library instruction is a well-integrated component of the required First Year Seminar (FYS) course. When I stepped into the Humanities Liaison position in 2013, I discovered that my colleagues had done excellent work standardizing the FYS library component learning outcomes, modules, and assessments. Each FYS section met with a Research and Instruction Liaison for a 90-minute session, during which students worked independently to complete a series of active learning modules hosted on Google Sites. With guidance from the liaison, during the FYS library session students learned how to:

1. Locate books in the HELIN catalog via author, title, or keyword;
2. Use reference sources to narrow and refine topics and determine relevant keywords;
3. Develop an awareness of the distinction between popular and scholarly sources, as both a question of intended audiences and as a technical question of differing tools and strategies for discovery;
4. Use database search tools to broaden and narrow search results via limiters (sidebar/checkboxes) and the query itself (Boolean operators);
5. Find follow-up assistance (liaison contacts, on call hours, etc.).

On account of the stability and success of the program, I perceived an opportunity for innovation. I wanted to make pedagogical adjustments while at the same time attempting to resolve a handful of logistical issues. The result was Wheaton College's FYS Research Lab (Fall 2014), a pilot program that experimented with inquiry-based learning, collaborative writing, and presentation during one-shot library instruction. In this paper, I will describe the design, implementation, and evaluation of the FYS Research Lab. The costs and benefits of inquiry-based learning will be reviewed. I will also ask readers to draw on their own experiences with one-shot instruction, reflecting on how they might either integrate or further extend the use of collaborative, inquiry-based learning in their teaching.

In order to begin the process of creating an inquiry-based activity**:**

- Identify a goal or learning objective.
- What prior knowledge do the students bring and/or what is their academic level?

DESIGN

The initial idea for the FYS Research Lab developed after I attended a NERCOMP (NorthEast Regional Computing Program) workshop focused on digital humanities at the undergraduate level. That day, a panel of students presented their digital projects. One student praised his university's digital humanities laboratory, a physical space filled with the technology and professional expertise necessary to support students working on a range of projects across disciplines. This student highlighted the importance of peer learning and collaboration in the laboratory, which was intriguing given that students visited the lab on their own time and each for a purpose unique to his or her project. I thought: Would it be possible to create an analogous experience for students at my small liberal arts college?

Rather than building and staffing a digital humanities lab on campus, I was more interested in thinking about how learning happens in a laboratory environment. Generally, researchers worked in teams to formulate questions, establish procedures, find solutions, and share results. Though my familiarity with scientific method ended there, something in the spirit of scientific inquiry appealed to me. I envisioned a "research laboratory" for First Year Seminar. During lab time, students would engage in collaborative learning centered around a research problem. They would work in small groups to write up the results of their research in Google Docs, and would be prepared to share these findings with me and their peers. My role would change from lecturer at the head of the class to that of facilitator and guide, as I followed live versions of student writing in Google Docs, while checking in with groups and periodically speaking to the entire class throughout the duration of lab time (90 minutes).

I had other goals for the FYS Research Lab. Knowing that 100 percent of Wheaton students arrive on campus with at least one internet capable device, I planned to test the feasibility of BYOD (Bring Your Own Device). This decision not only reduced competition for busy computer classrooms in the library, it also led to experimental class sizes because the lab could meet in any room on campus with modular furniture and a projector. Instead of meeting with each section of FYS (10 sections x 90 minute sessions = 900 minutes of my time), I limited the number of labs that I would facilitate, ultimately offering four FYS Research Lab timeslots to ten course sections. In any given FYS Research Lab, I met with either two or three merged sections (4 labs x 90 minutes = 360 minutes of my time). Students benefited from working in interdisciplinary teams and meeting other first years. I saved time and lessened the tedium brought on by teaching a standardized lesson ten times in a row.

At an institution that prides itself on small class size, I was concerned about how FYS faculty would respond to this idea. As part of the planning process, I met with three faculty in the Humanities to ask for feedback. I then contacted all of my FYS faculty partners to gauge their opinions and willingness to synchronize schedules. With their input and support, I pitched the idea to the Director of Research and Instruction. I walked away from our meeting with two additional requirements for the FYS Research Lab: 1) All activities would be designed to meet the existing FYS library component learning outcomes; and 2) At the end of the lab, all students would complete the standardized FYS "skill check," a series of questions tailored to assess student learning in the modules used by the other liaisons.

Structured Inquiry-Based Learning

My conversation with the Director of Research and Instruction established strict parameters around what students would learn during the lab, and how they would be evaluated. With this in mind, I began looking for an approach that would permit controlled exploration of a research question. The methodology that I adopted, Inquiry-based Learning, is used most often in the sciences. During an inquiry-based activity, student learning is focused on finding a solution to a central problem. Students often work in teams. The instructor plays a support role.

An article aimed at fifth grade science teachers helped me to conceptualize the design of inquiry-based learning activities. The authors, Heather Banchi and Randy Bell (2008), developed a continuum for categorizing different types of inquiry-based lessons. Banchi and Bell identified four levels of inquiry:

1. **Confirmation Inquiry**--Instructor provides the question, procedure, and solution. Students confirm the results.
2. **Structured Inquiry**--Instructor provides the question and procedure. Students solve.
3. **Guided Inquiry**--Instructor provides the question. Students design the procedure and solve.
4. **Open Inquiry**--Students formulate question, procedure, and solve.

Given the academic level of first year students and external requirements for learning and assessment, I opted for a structured inquiry in the FYS Research Lab. A structured inquiry would allow me to outline the research problem and dictate the procedures, ensuring that students consulted pre-selected sources and practiced specific skills. This would give them the best chance of success on the standardized skill check. When the time came to write the lesson, I wrote the structured inquiry as a case study with follow-up questions. Elizabeth Peterson's (2010) "Problem Based Learning as Teaching Strategy" in *Critical Library Instruction: Theories & Method*s was enormously influential as I thought through this process and devised the case study.

Toward the end of the planning phase, Wheaton's Digital Content Strategist wisely recommended that I publish a website containing all materials relevant to the FYS Research Lab, including case studies, links to library resources, scheduling, room assignments, and general information about the pilot and its goals. I also realized that a website would be an excellent repository for the collaborative "lab reports" that students would write and share during class. The website continues to be important, as I spend time this summer conducting a qualitative assessment of work produced by students in those lab reports.

My recommendations for designing an inquiry-based activity**:**

- Think back to the learning objective that you identified earlier. What is an appropriate level of inquiry given the academic level of your students?
- What kind of task(s) will you assign to meet the requirements of the level of inquiry? Will students work collaboratively or independently?
- Does your activity require the use of specific technologies (e.g. Google Docs, blogs, pen and paper, iPad, smart phone, etc.)?

FYS RESEARCH LAB PILOT (FALL 2014)

Compared to the amount of planning that went into the FYS Research Lab, facilitating the 90-minute sessions was a breeze. I spent time at the beginning of each lab greeting students, handing them a hard copy of the case study (most had already previewed it on the website), and randomizing the seating arrangements. I introduced myself, the faculty, and the library resources that they would need get their work done. Then I met with each group, prioritizing the need for support based on the progress that they were making in their lab reports, which they shared with me via Google Docs. After 45 minutes, when I could see that all groups had finished at least 50 percent of the questions, I asked specific groups to present their findings to the entire class. I used the projector to display their lab reports as they spoke. Students then returned to group work, at which point they completed their reports, and again we discussed the results as a class. With 5-10 minutes remaining in the lab, I asked students to take the end-of-class FYS Skill Check, the assessment tool hosted on Google Forms.

Asking students to BYOD was not problematic at Wheaton. Library-owned laptops were available to students, but the need was slight; maybe one or two students borrowed a laptop when they forgot their own or their

machines ran out of power. Another worry was classroom management. Group work, the internet, personal computing devices—each presents a unique temptation for losing focus. I observed, however, that students were engaged and motivated to do well on their lab reports, especially because I could follow their progress in Google Docs and use the projector to share their work with the entire class, including the faculty.

I was surprised by how difficult it was for me to offer only minimal instruction during class. There were moments when I was not sure of either what to do with myself or where to situate myself within the classroom. I also discovered a need to involve faculty who were present. What would they be doing during the FYS Research Lab? Some faculty chatted amongst themselves, others checked-in with students, and one pair of faculty members completed the case study and published it in Google Docs alongside the students.

Evaluation

From my perspective, I enjoyed designing the case study, handing the class over to students during the lab, and reducing the total number of FYS sessions. To learn more about the faculty experience, I emailed a set of questions to all faculty participants. Their response was overwhelmingly positive and constructive. Here are a few comments that do a good job representing the tone of the feedback: *Best library session ever; No pedagogical advantage to merging FYS sections; Combining FYS was a genius move; Prepare students for group work with an ice breaker; Inquiry-based learning is the best (highest impact) strategy.*

With regard to student assessment, it is not the practice of liaisons to separate session-level data from all data captured by the FYS Skill Check. In other words, assessment data produced by students during the FYS Research Lab will not be compared with students in other FYS sessions. As a whole, assessment data indicated that student performance in the library catalog fell a few points. We later discovered a flaw in our new discovery system that probably contributed to this trend. This summer I plan to conduct a qualitative analysis of student learning using the "lab reports" that I collected and deposited to the FYS Research Lab website.

As with any methodology, there are benefits and costs to inquiry-based learning. Studies show that students learn best when they take an active approach (Smart & Csapo, 2007). Lecture relies on rote memorization, with limited or no opportunities for students to develop process and judgment, leaving very little behind when students forget the material. On the other hand, research shows that lecture is critical for learning brand new skills (Robertson, 2006). For sure, the results of inquiry-based learning can be unexpected and messy; lecture is a more organized, predictable way to deliver instruction. Other considerations around inquiry-based learning include:

- Gaining access to flexible classroom spaces that offer relevant technologies and modular furniture;
- Rethinking the role of the instructor and his/her physical presence in the classroom;
- Investing more time to plan and prepare activities;
- Finding ways to maintain student engagement, which can suffer without intervention.

My recommendations for finalizing your plans for integrating an inquiry-based learning:

- Where will you teach (e.g., online, library classroom, active learning space, blended learning environment)?
- Can you identify at least one benefit and one cost to changing the way you teach this learning objective?

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APPENDIX A

First Year Seminar
11:00am-12:20pm, October 21, 2014
Language Lab, Meneely Hall
Website: http://tinyurl.com/whearesearch

Faculty: Professor Nancy Kendrick and Professor Joel Relihan
Librarian: Amy Barlow, Humanities Liaison

CASE STUDY 1

Scenario:

Ebenezer (aka Eben) noticed a report that went viral on Facebook last week. It was a story about a restaurant that investigated complaints by customers claiming that service was slow. The restaurant analyzed video footage to discover that service was indeed slower than it had been in previous years. They concluded that customers were to blame for the slowdown: Customers checked social media instead of reading the menu, and later they were taking photos of themselves and their food instead of eating.

The story captured Eben's attention and, let's be honest, he had to write a research paper on a topic at the intersection of food and social media. He decided to research the *food porn* phenomenon because he wanted to learn more about why we enjoy looking at beautiful, staged images of other people's food on sites like Instagram and on TV cooking shows.

Eben will need to consult a variety of source types to define what food porn is, understand its cultural significance (e.g. history, demographics, etc.), and to find scholarly research articles on the topic. Eben is asking you for help. What would you recommend as a starting points for his research? Please use the resources and questions listed below to guide your recommendations.

Resources:

- Wallace Library Website
- Books @ **HELIN Library Catalog**
- Background info @ **Wikipedia or Credo Reference** (Wallace Library Website→ Databases A-Z→ C)
- Zurcher, Anthony. "Smartphone Use in Restaurants Prompts Craigslist Rant." *BBC News*. N.p., 14 Jul. 2014.
- ray, krishnendu. "Domesticating Cuisine: Food and Aesthetics on American Television." *Gastronomica: The Journal of Critical Food Studies*, Vol. 7, No. 1 (Winter 2007), pp. 50-63.
- Scholarly articles @ **Academic OneFile** (Wallace Library Website→ Databases A-Z→ A)

Group Report Requirements:

Be prepared to present your recommendations to the class through the creation of a **Google doc**. One person will need to **create** the doc and then **share** it with members of the group. **Share** it with me (barlow_amy) as well. Put your names on it. Here is an example of how it might look. Please address the following questions.

1. How can Eben use a source like Wikipedia or Credo Reference to narrow and broaden his topic? Can you give a concrete example, using keywords to demonstrate your point? What tips would you give him about this kind of source?

2. Can you suggest a book or ebook from the HELIN Library Catalog for Eben to borrow? How is it relevant to his project? Is it available at Wheaton or is it located at another school? Which school?

3. If you had to compare the Anthony Zurcher article with the krishnendu ray article, how would you describe the differences? Can you list four criteria that would you use to distinguish between a popular (*BBC*) and scholarly (*Gastronomica*) source? Is *Gastronomica* a peer-reviewed journal, and can you tell Eben what that might mean?

4. Can you use Academic OneFile to locate a relevant academic journal article for Eben? If your initial search for *food porn* is too limiting, try to think about the topic in broader terms, like a search for *food AND social media. food AND blog* may also work. Be creative! Use the limiters on the left side of the screen to manipulate your results list. Share your keywords and at least one peer-reviewed article that you found using your keywords.

5. Bonus: What are Eben's next steps? What questions should he be asking and where should he go for help?

End of class quiz: Take the FYS research challenge