

CASE #20

FYRE in Special Collections: Exploring Scientific History in a First-Year Research Experience Course

AUTHORS

Rachel Makarowski
Special Collections Librarian
Miami University
makarorm@miamioh.edu

Ginny Boehme
Science Librarian
Miami University
boehmemv@miamioh.edu

LEARNING OBJECTIVES ENGAGED FROM [GUIDELINES FOR PRIMARY SOURCE LITERACY](#) BY THIS CASE STUDY

- 2.A. Identify the possible location of primary sources.
- 2.B. Use appropriate, efficient, and effective search strategies in order to locate primary sources. Be familiar with the most common ways primary sources are described, such as catalog records and archival finding aids.
- 3.A. Examine a primary source, which may require the ability to read a particular script, font, or language, to understand or operate a particular technology, or to comprehend vocabulary, syntax, and communication norms of the time period and location where the source was created.
- 3.B. Identify and communication information found in primary sources, including summarizing the content of the source and identifying and reporting key components such as how it was created, by whom, when, and what it is.
- 3.C. Understand that a primary source may exist in a variety of iterations, including excerpts, transcriptions, and translations, due to publication, copying, and other transformations.

- 4.A. Assess the appropriateness of a primary source for meeting the goals of a specific research or creative project.
- 4.C. Situate a primary source in context by applying knowledge about the time and culture in which it was created; the author or creator; its format, genre, or publication history; or related materials in a collection.
- 5.A. Examine and synthesize a variety of sources in order to construct, support, or dispute a research argument.
- 5.C. Cite sources with appropriate citation style guidelines or according to repository practice and preferences (when possible).

CASE STUDY LOCATION Miami University
 Oxford, Ohio
 <http://www.miamioh.edu>

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Introduction and Institutional Context

Miami University is a mid-size public institution in southwest Ohio with approximately 18,000 undergraduate students. It is designated by the Carnegie Classification as an R2 institution, with high research activity. Miami has a liberal arts-based curriculum, but has been working to expand its research offerings and increase the proportion of undergraduate students who collaborate with faculty on research. The First-Year Research Experience (FYRE) program is one such attempt.

First implemented a decade ago, the FYRE program aimed to increase the diversity of STEM (science, technology, engineering, and math/medicine) majors. It has taken many different forms over the years, with the current iteration consisting of credit-bearing courses led by one or more faculty sponsors. The courses have primarily been based around what one might think of as "traditional" science research. Students gain hands-on experience completing a discrete research project: constructing a research question, designing methodologies, collecting and analyzing data, and disseminating findings. These projects can be a comprehensive, in-depth introduction to the research process, but they typically cater to those who are already scientifically-inclined.

The Miami University Libraries in recent years has increasingly focused on creating new partnerships and collaborations both inside and outside the library system. The science librarian, together with the head of her department and the director of the campus' natural history museum, saw the FYRE program as an opportunity to strengthen the relationship between the libraries and the museum. They co-developed a course within the FYRE program called "Creating Museum Exhibits" as a way to provide students with an interdisciplinary research experience centered around the natural sciences. The course allowed the faculty to introduce interested students to more creativity-based museological research, drawing upon the expertise of each individual faculty member. It also offered an additional opportunity to collaborate with the special collections librarian and expand the STEM-related instruction within Miami's Walter Havighurst Special Collections, University Archives, and Preservation.

The Walter Havighurst Special Collections, University Archives, and Preservation, housed on the third floor of Miami University's Edgar W. King Library, is staffed by five full-time, tenure-track librarians and two full-time hourly staff. Although all five librarians are responsible for instruction, the Special Collections Librarian has increasingly taken on a considerable portion of the department's instruction, averaging approximately 20–22 class sessions each semester. These classes, which are almost entirely taught for humanities-based courses, pull heavily from the Walter Havighurst's literature, history, and university archival collections.

This case study highlights the benefits and challenges of introducing a very small class of first-year students to special collections and conducting historical research in science-related fields. The study will primarily focus on the collaborations between Special Collections Librarian Rachel Makarowski and Science Librarian Ginny Boehme, who served as one of the main instructors for "Creating Museum Exhibits." The two other collaborators who also served as co-instructors of the course were Steve Sullivan, director of the Hefner Museum of Natural History, and Kevin Messner, head of the libraries' Advise and Instruct Department. Although they were not as involved in designing the special collections instruction session, they were active in discussion throughout the class visit to the archives.

The FYRE courses are driven and shaped by the curiosity of the students enrolled. Makarowski and Boehme designed the visit to special collections to foster this exploratory spirit and to explicitly address the following *Guidelines for Primary Source Literacy*:

- 3.A. Examine a primary source, which may require the ability to read a particular script, font, or language, to understand or operate a particular technology, or to comprehend vocabulary, syntax, and communication norms of the time period and location where the source was created.
- 3.B. Identify and communicate information found in primary sources, including summarizing the content of the source and identifying and reporting key components such as how it was created, by whom, when, and what it is.
- 4.A. Assess the appropriateness of a primary source for meeting the goals of a specific research or creative project.
- 4.C. Situate a primary source in context by applying knowledge about the time and culture in which it was created; the author or creator; its format, genre, publication history; or related materials in a collection.

Objectives 3.A. and 3.B. were deemed particularly important for the visit, both based on the materials chosen for the class session and for their natural progression into 4.A. and 4.C., which were learning objectives not only for the special collections session, but for the class overall.

Narrative

The "Creating Museum Exhibits" FYRE course—as taught by Sullivan, Boehme, and Messner—centered around teaching research skills through museological exhibit design, using two different exhibit topics as overarching course projects. One project was based around revitalizing an existing arboreal exhibit, the campus "Tree Walk." The Tree Walk was first installed approximately forty years ago, but has not been maintained in the intervening years and does not adhere to current practices of accessible design. The other project was based around the creation of a new exhibit: a scale model of the solar system to be installed throughout Miami's campus and the surrounding town. The final deliverables for the class were two sets of meticulously-researched exhibit labels (one set for each project) and an annotated bibliography listing at minimum one source consulted for each of their labels.

Boehme approached Makarowski in fall 2019 to discuss the potential of bringing her FYRE class to special collections for a fifty-minute, one-shot instruction session. The session, as Boehme proposed, would be an opportunity for her four students to research historical background information for both the Tree Walk exhibit and the astronomy exhibit in an engaging, immersive way. During the class visit, students would examine the rare books agreed upon by Boehme, Makarowski, Messner, and Sullivan, with the goal of exploring information that could be useful for historical contextualization of their topics. They could then synthesize their notes from the special collections session with secondary sources and incorporate it into their final exhibit labels to whatever extent they thought was pertinent.

Makarowski and Boehme then chose the primary source literacy learning objectives that they would plan to address during the session. They found several that were relevant to the course, but they settled on 3.B., 4.A., and 4.C. as those were what would be most instrumental to the session and the final class project. After selecting a date for the session that would work for all four instructors, Makarowski and Boehme then created an initial pull list of rare books that fit the project topics, selecting primarily from the underutilized pre-twentieth century textbook and botany collections. The selected works would inform students about historical thought and past discoveries that provided the foundation for current knowledge in these fields. The books were then evaluated for preservation concerns by Makarowski and potential value to the students by Boehme, Sullivan, and Messner. They met to review and finalize the pull list approximately a week in advance of the class visit.

Finalizing the pull list provided a few complications: some of the items that had the potential to be the most useful had some of the most serious preservation concerns, meaning that they needed to be left out of the instruction session. Anticipating which items would be most useful to the students—who were allowed to explore what they were passionate and curious about, and who had ample autonomy in picking what their labels would cover—was also surprisingly challenging. However, the careful examination and finalization of the pull list revealed that a fourth learning objective from the primary source literacy guidelines, 3.A, had to be added because many of the books featured typographical features that temporarily arrest most students.

Boehme and Makarowski set up the physical classroom space the day before the class. There was one small group of tables where a selection of the botany books was set out, and a second group of tables for a selection of the astronomy-related books. There were more books and chairs set up than students, who were encouraged to explore beyond the object they happened to sit down in front of at the beginning of the session. The rest of the books that were pulled for the session but not on display were available on a cart in the classroom to be swapped out at the students' request. Although the instructors did not offer the students the opportunity to find the collections through the library catalog, having the cart of extra materials allowed students the autonomy to choose what they thought would be relevant to the project on a smaller scale.

Makarowski began the session by introducing the students to special collections and archives, the rules and handling procedures of working with unique collections, and the role that these types of collections play in research in general terms. After Makarowski's introduction, Boehme, Sullivan, and Messner specified how these collections could be used by students to complete their course projects. The four instructors made the conscious choice to not incorporate a formal assignment as they would have done with a larger class; they instead chose a "Look, Think, Wonder" activity worksheet that would not be graded. This sheet guided students in learning how to approach primary sources, and provided instructors with prompts to facilitate discussion. With an instructor-student ratio of 1:1, it was easy to encourage students to take their observations one step further in conversation. The informal nature of the class session also helped foster dialogue between the students and instructors as an entire group.

The FYRE class visit to the special collections' classroom was the first time the students had ever been to an archives. Students were at first hesitant to touch the materials, but the demonstration by Makarowski on how to handle the books made them more confident in interacting with them. As students started to examine the books, the instructors circulated the room. They each asked students questions based on the "Look Think, Wonder" activity that would prompt them to learn how to analyze the books: Who were the books made for? How did they know? Was there any evidence of readership interaction with the book? What did that tell them about how the book was used by readers? The activity and the questions asked by instructors were meant to facilitate Learning Outcome 3.B. in the *Guidelines for Primary Source Literacy*.

Students in the class not only answered these questions as they were investigating the collections, but also returned queries of their own:

- How were the books made?
- Why were images in some of the books only printed on one side on special paper?
- How were the illustrations of plants printed, and how did the printed illustrations change over time?
- What was this letter that looked like an 'f' that should have been an 's'?
- Why did the "long s" exist and when did it fall into disuse?
- Did anyone else notice that Neptune was being referred to as "Le Verrier" in the earlier textbooks?
- Why was the name eventually changed to Neptune?

Makarowski took the lead in answering questions related to book history and printing processes and the course faculty provided the answers for the more subject-specific questions. This student-centered discourse allowed the instructors to address additional learning objectives from the *Guidelines for Primary Source Literacy*.

Students took extensive notes during the class, and even sparked discussions regarding the differences between archives and museums, how "primary source" appeared to have different meanings depending on the discipline, and how some objects might be a primary or secondary source depending on the context of its use. The more flexible, open-ended discussion amongst the entire group helped students to not develop tunnel vision in trying to answer only activity questions; it instead gave them the agency to pursue inquiries that were of more interest to them.

Some students compared notes with one another based on what collection items they examined, as they were unable to view all of the items that had been pulled in the short, fifty-minute time frame of the session. Makarowski agreed to keep the items on hold for the class for the rest of the semester so that any student who wanted to come back to conduct further research on their own time would be able to more easily request access to the books in the Reading Room. Instructors gave the students Makarowski's contact information so that they could set up an independent research consultation if needed

Results

The course instructors strived to provide students with a solid foundation of broad information literacy skills. They scaffolded threshold concepts from ACRL's [*Framework for Information Literacy for Higher Education*](#) throughout the course, and they designed in-class activities to build upon one another in a coherent way. However, these activities were not always overtly tied to the course assignments. Instead, the course faculty asked the students to employ their critical thinking skills and connect general theory to practical applications and to the larger course projects. As such, it is difficult to accurately assess the impact that any one class activity, including the visit to special collections and archives, ultimately had on the final class deliverables. That being said, there are some observations that can be made.

As previously mentioned, the materials pulled for the in-class visit remained available to the students to peruse for the remainder of the semester. One student took advantage of this to do further historical research for her assigned labels. She became comfortable enough with special collections staff that she approached the university archivist for help researching a possible alumnus who had a connection to one of her labels. In addition, two of the students from the fall semester decided to continue working on the Tree Walk exhibit as an independent study project in the spring, and specifically requested another, more in-depth visit to the archives in February 2020. During this visit, the students revisited the botany books they consulted the previous semester and requested new books they had identified as potentially relevant from the library catalog. The interest from the students in dedicating additional class time to primary source research speaks to the value of both the initial visit in fall 2019 and the collections held by Miami University.

The initial visit also provided some opportunity to further expand upon and emphasize some general information literacy concepts that had previously come up in class discussion. For example, the term *primary source* can mean different things depending on context. The class had already learned this concept from class discussions about source levels (primary, secondary, tertiary), but found renewed interest in this discussion during the class visit. Being able to actually handle the objects from special collections and archives instead of simply finding digital representations online made the students more aware of the importance of context for the objects and their information when determining the level and appropriateness of a source for a particular need.

Makarowski and Boehme planned to focus primarily on the four learning objectives mentioned above. However, with the loose structure of the session and general inquisitiveness of the students, additional learning objectives popped up organically. Objectives 2.A. and 2.B. were discussed towards the end of the session as the students were processing the information they had discovered and the additional questions that arose during their initial source exploration. Objective 3.C. came up naturally as part of the additional discussion of what defines a primary source, and the variety of formats in which they may appear. Objectives 5.A. and 5.C. were briefly addressed during the session, with Boehme, Sullivan, and Messner covering them more in depth later in the semester when the students began writing their labels and pulling together their annotated bibliographies.

Lessons Learned

It was daunting to have a class session that had a skeletal lesson plan with only learning objectives and a single, low-stakes guiding activity. However, the students' continued use of the materials both that semester and the following semester demonstrated the value of the special collections session to the instructors. The planned learning objectives were met, and some additional objectives were unintentionally incorporated during the class session as a result of the students' curiosity. The flexible, inquiry-based nature of the session allowed for interesting, unscripted discussions that went beyond the activity-focused narrative. However, the lack of a formal, graded activity and exit ticket, as well as the lack of requirement to incorporate materials from special collections into the labels, made formal assessment difficult.

The instructors are also aware that the session format—more open exploration time with no required activity—works best with smaller class sizes, which generally are more comfortable in being honest about what they do not already know and more open in their curiosity with both each other and their instructors. If the class size was larger than eight students, it would have been appropriate to incorporate a graded primary source summary and analysis activity. Since the larger class size would result in less one-on-one student-instructor interaction, having an assignment to hand in at the end would encourage students to engage with the activity independently. Students could also be asked to identify one thing to share that they might incorporate into their labels as well as one question that they had about something they encountered when looking at the books. Even if every student was not able to speak, the share out would still facilitate class-wide discussion on common themes and issues encountered. Instructors could then use this discussion as an indication of what the students understood at a base level and what concepts need to be further addressed.

It is currently unclear when this FYRE course will be taught again, or if it will exist in a similar iteration as it did in the 2019–2020 academic year. When next taught, instructors have identified areas where primary source literacy could be more formally incorporated into the course beyond a single special collections visit, as they feel that researching using special collections materials is a valuable learning experience that is rarely offered in STEM disciplines. They find that having students engage with historical materials allows them to gain a better understanding of how scientific discourse has changed over the centuries, yet continues to influence current practices of scholarly conversation. Regardless of the future of FYRE, the collaborative relationships between all of the instructors have been established for prospective endeavors both within and outside of the libraries.

If the course is taught again, Makarowski plans on including a more formal assessment of the special collections session with an entrance and exit ticket. There will still be open time for exploration and discussion so that students can follow their curiosity and passion in the classroom. When planning the initial visit, the instructors decided to not give students the option to search the catalog, as they were unsure of how useful the visit would be to the students' final deliverable. However, given the enthusiasm of the students and their request for a return visit, Makarowski would like to teach them how to search the catalog for special collections material either before or during their first visit. This would allow students more

autonomy in using special collections in general, and they could then use a class session to view materials they have chosen for themselves from the catalog and finding aids.

Overall, the instructors are pleased with how the class session went. The students left with a greater understanding of an archive, how to work with rare materials, a better conceptualization of primary sources, and the experience of doing hands-on research with special collections. Most importantly, they left special collections and archives with the passion and curiosity about primary sources that, even if they pursue a major outside of museum studies or history, will stay with them for the rest of their college careers.

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