Cooking with Authority

Using a Flipped Lesson and Librarian Meeting to Evaluate Authority

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NUTRITION INFORMATION
This recipe is designed for an introduction to design course and is most suited to courses with a team project. It can be used to support courses in disciplines across STEM, especially environmental science, mechanical engineering, sustainability studies, and civil engineering. It can also be effectively deployed in courses in which students engage with stakeholders or customers of some sort. Librarians can use the lesson to help students tease out the contextual nature of authority and the role of stakeholder input plays in good design.

The lesson, embedded in the course learning management system (LMS), introduces students to source evaluation techniques and the use of scholarly or authoritative sources in their research. The librarian team meeting reinforces concepts learned and helps teams begin locating appropriate sources. As a flipped lesson, this recipe fosters student engagement with a librarian, saves in-class time, and teaches foundational concepts using a variety of content types.

At the Colorado School of Mines, this lesson is situated in the first year Introduction to Design course. Because it is a problem-based learning course, students are given a complex problem and then spend the semester defining their problem and designing a solution to that problem. Previous topics this lesson has worked well with include food desert mitigation, urban bicycle and pedestrian safety, upcycling the waste stream, and sustainable urban infrastructure. The lesson has been used for courses ranging in size from 1 section of 5 teams to 21 sections with a total of 115 teams.

LEARNING OUTCOMES
After the LMS lesson and librarian meeting, students will be able to

• Identify the features of scholarly and authoritative sources
• Explain the types of authority figures (people, organizations, government entities) particularly applicable to their definition of the design problem
• List the types of sources needed to begin designing a solution
• Evaluate potential sources for inclusion in their team’s project

NUMBER SERVED
Meeting schedule is scalable based on librarian availability. Estimate 10–15 team meetings per librarian depending on other duties. Teams typically include 4–6 students.

COOKING TIME
Allow up to 2 hours for prep, 30 minutes for completion of LMS lesson, and 30 minutes for each team meeting.

DIETARY GUIDELINES
This recipe addresses the Frame Authority Is Constructed and Contextual. Introduction to design typically focuses on design thinking, which encompasses asking questions, gathering sources, testing, and iterating on a design. It is crucial for students to understand that authority sources vary depending on their team’s definition of the design problem. For example, a team designing an approach to address the problem of energy conservation faced by homeowners will have different authoritative source needs than a team addressing the problem in corporate or university settings.

INGREDIENTS AND EQUIPMENT
First Course: LMS Lesson
• Text and videos or tutorials on identifying scholarly and authoritative sources.
• Example sources related to the project topic students can practice evaluating.
• 5–10 quiz questions to test students’ understanding of the module.
Section 2. Teaching, Learning, and Research Services

Second Course: Team Meeting
- 1–2 quiet spaces, preferably in the library, for consulting with teams. Group study rooms or research consultation rooms that can be reserved work best.
- Instructor laptop and projector or large monitor.
- Course research guide tailored to the problem topic of the semester.
- Slips or master list for tracking team attendance at meetings.

PREPARATION
Preparation time is up to 2 hours depending on librarian comfort with editing content in the LMS. Lesson content can also be situated in a research guide or library webpage if needed. Librarian-chefs will need to gather materials to include in the LMS module and identify or create quiz questions. While designing the LMS module and quiz, additional content can be added as appropriate to the specific course. Consult with teaching faculty on an amount of credit to award for the lesson (recommended) and appropriate due dates for completion of the quiz and team meeting. Prepare additional librarian-chefs for their meetings by providing them with example problem definitions, the assignment prompt, access to the LMS lesson, and examples of appropriate authority figures for the semester topic.

COOKING METHOD
First Course: LMS Lesson
The LMS lesson provides content in multiple formats, including text, video, and hands-on practice, to best convey concepts to students. The LMS lesson, due prior to the team’s meeting with a librarian, is comprised of the following topics:

1. **Features of scholarly sources.**
   Scholarly source definition, 1–2 videos or tutorials that describe scholarly sources, 2–3 examples of scholarly sources students can practice evaluating. For example, a scholarly article from *Accident Analysis and Prevention* and a technical report from NTSHA would be appropriate example sources for a project topic on pedestrian safety.

2. **Features of authoritative sources.**
   Authority definition and its contextual nature description, 1–2 videos or tutorials that describe authoritative sources, 2–3 examples of on-topic authoritative sources students can practice evaluating. For example, a TED talk by an electrical engineer, a website maintained by the state government, and an interview with a solar company executive would be appropriate example sources for a project topic on sustainable grid design.

3. Optional topics can include a brief explanation of the required citation style and an embedded version of the course research guide. For example, the Colorado School of Mines emphasizes the use of IEEE citing style, and the LMS lesson includes tips for using the style.

4. **Instructions for setting up their team meeting.** Including a link to a sign-up sheet, location, dates, important contact information, and tips for a successful team meeting.

5. **Quiz.** A brief 5–10-question quiz to test students’ understanding of the content provided in the module. Ask one to two questions per topic covered in the module. See the figure for an example quiz. All the questions can be used as formative assessment; topics students struggle with on the quiz can be revisited and emphasized in the team meetings.

Note: Student preparation is especially key to the success of the team meeting. For optimum success, students will complete the LMS lesson before their meeting and arrive prepared with questions for their librarian as well as notebooks for taking notes.

Second Course: Team Meeting
The 20–30-minute team meeting needs to be flexible enough to address the specific needs and questions of each team. It can roughly follow this format:

1. **Review of the LMS lesson.** Ask students to describe the features of a scholarly source and to define authority.

2. **Discussion of their problem definition.** Ask students about their team’s progress on the project and their definition of the course problem. You may need to help them refine their problem by asking follow-up questions.
3. **Discussion of potential sources.**

Help the team brainstorm the types of information they'll need to design their solution, including articles, standards, handbooks, statistics, government reports, building codes, and so on. Then discuss where those types of sources can be obtained. Remind students how to access the course research guide.

4. Save time to address any questions students may have about the assignment, quiz, research, or using the library.

5. Note the team's attendance in completing the meeting.

**ALLERGY WARNINGS**

If you are working with multiple sections of the same course, attempt to get your LMS lesson into the master course (called a blueprint course in Canvas) to reduce the need to update the lesson in each section individually. While this lesson can be scaled to serve multiple sections of the same course, some elements may not scale as well as others. For the LMS quiz, consider your ability to grade multiple open-ended questions across multiple sections. For large-scale implementation, close-ended multiple-choice or fill-in-the-blank questions work best. Anticipate a maximum of 10-15 team meetings per librar-
ian in one week, and consider staff ability to cover all team meetings across a course.

If team meetings will count for course credit (recommended), devise an easy strategy for librarians to track teams that have completed their meeting. Low-tech solution—a slip can be filled out by each team at the end of the meeting and then compiled for course faculty. High-tech solution—librarians add team name and instructor to a master list after each meeting that is then shared with course faculty.

**CHEF’S NOTES**

This lesson can be modified into a one-shot session to fit staffing and course needs. The LMS lesson would be converted to an in-class lecture and discussion. Then the librarian would spend time with each team in the classroom to answer questions and consult on their specific sustainability topic. The team meeting can also be held online, via a tool such as Zoom, to adapt the lesson to fully online courses.

This recipe becomes more flavorful with reinforcement later in the semester. Opportunities for reinforcement can include a brief homework module in the LMS reminding students to consider the authority of their sources or librarian office hours in the department during the midpoint of the semester. This type of activity reminds students of the earlier lesson and doesn’t require significant time investment for library staff. Library staff can also partner with the campus writing center and course faculty to offer a research and writing event in the week before the final project is due, providing students targeted access help at their final point of need.

**ADDITIONAL RESOURCES**
