Gina Petersen and Jason Kruse

Research is messy

Teaching students to expect non-linear research

As academic librarians, we provide an array of research services to support teaching and learning on campus. We lead instruction sessions on how to search databases effectively, demo software during workshops, and prepare guides on conducting research. We highlight tools and techniques that instill good research habits, helping students develop advanced research skills that they can use throughout their academic careers and beyond. Because librarians prepare for these activities, often with canned searches and preselected examples of good articles, we can make research look much easier than it is. The messiness of research and how literature searching fits within the larger research process often gets left out. As librarians, we are familiar with this messiness and may allude to it, but how often are we explicitly telling students what to expect?

We wondered what role Northwestern University Libraries could play in teaching emerging researchers that the research process is nonlinear and messy, that an iterative process does not inherently suggest setbacks. Graduate students make up more than half of the student body at Northwestern University and are often assumed to have highly developed research skills. In reality, graduate students have a wide range of research skills and experience based on a variety of factors, including their previous institutions, availability of research opportunities, prior training and research support, individual learning styles, and self-perceptions of skills. There is no guarantee the foundations for developing advanced research skills have been laid. To respond to this, we developed and piloted a workshop aimed at graduate students that addresses the messiness of the research process as well as common obstacles or interruptions.

Our learning goals were purposefully broad so they would be applicable to researchers from all disciplines. We wanted participants to consider the pitfalls and opportunities of research while learning about strategies and services that can help them navigate the nonlinear research process, including those located outside the library. By normalizing research struggles, we hope these emerging researchers will feel more prepared and more comfortable seeking support.

Workshop outline

We introduce the workshop by reflecting on the research process and how it is typically portrayed. We ask participants to list the steps of the research process, and we show an idealized, linear diagram (figure 1).

Gina Petersen is assessment librarian, email: gina.petersen@northwestern.edu, and Jason Kruse is undergraduate engagement librarian at the Northwestern University Libraries, email: jkruse@northwestern.edu.

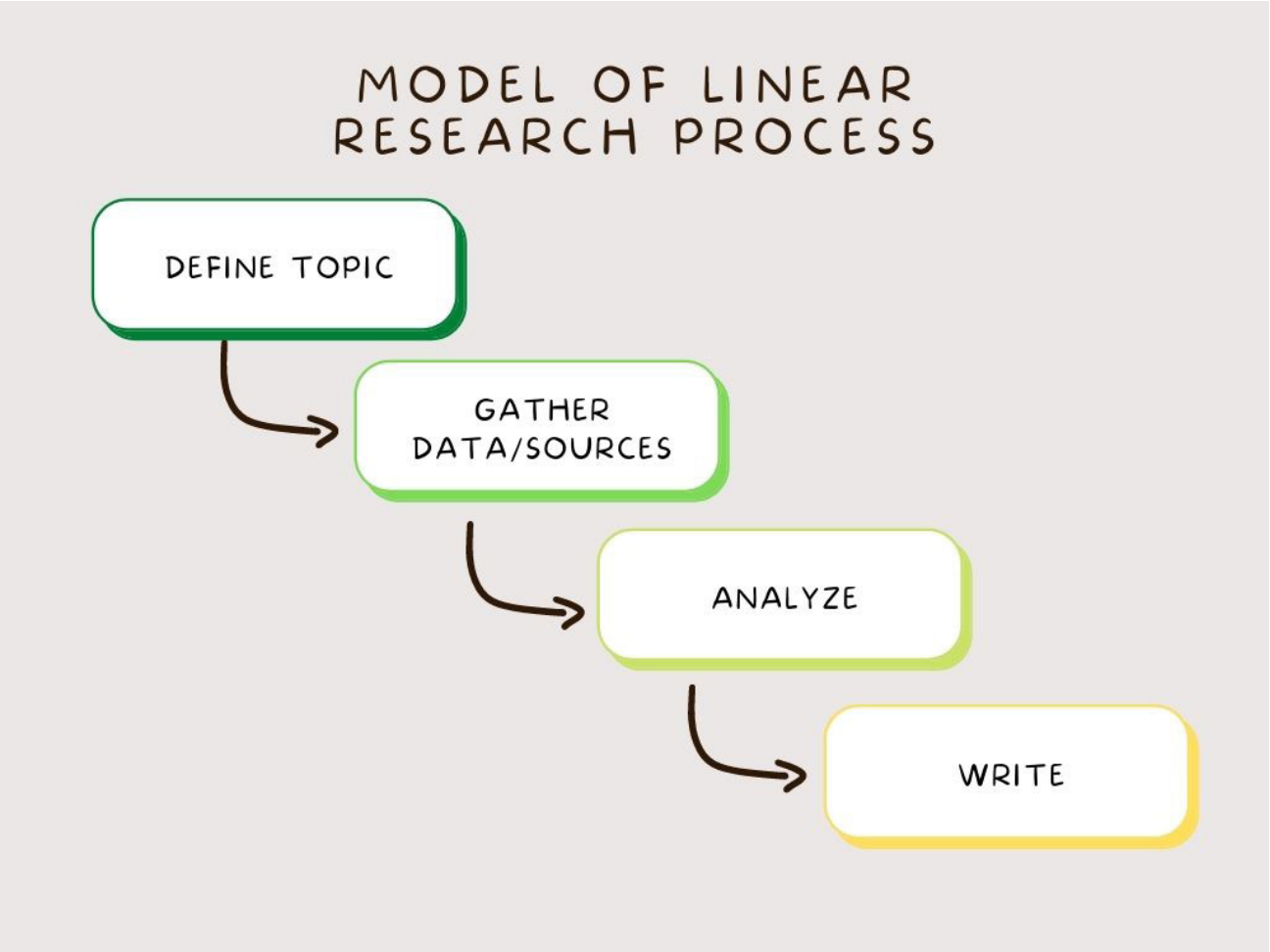

Figure 1. A model of a linear research process. Created in Canva.

From there, we present a more complicated diagram that incorporates an iterative research process (figure 2), modeling something closer to the reality of how people conduct research. In real life, research often involves overlapping steps or bouncing back and forth between different parts of the process. For example, during analysis, a researcher might need to revisit literature to determine why they are observing unexpected results, or they might go back to gather additional sources after reading an insightful comment from a reviewer.

Next, we ask participants whom they turn to when they get stuck or need guidance; this highlights the importance of networks that students must build throughout their research careers and encourages and normalizes help-seeking behavior.

The bulk of the workshop focuses on unexpected twists and turns in the research process, illustrated by examples from various disciplines. The COVID-19 pandemic is an extreme example, but we focus on more standard unexpected events that can necessitate adjustments to scholars' research. We discuss changes in schedules and priorities due to these unexpected events, stressing the importance of building flexibility into timelines to allow for parts of the research project to be conducted out of order if needed. The highlighted twists and turns include the following:

- Scope creep: To combat scope creep, researchers can set clear guardrails, revisit and revise their research question to stay within scope, and save peripheral research questions for future projects.
- Data access issues: Data might be unavailable in various ways, including not being

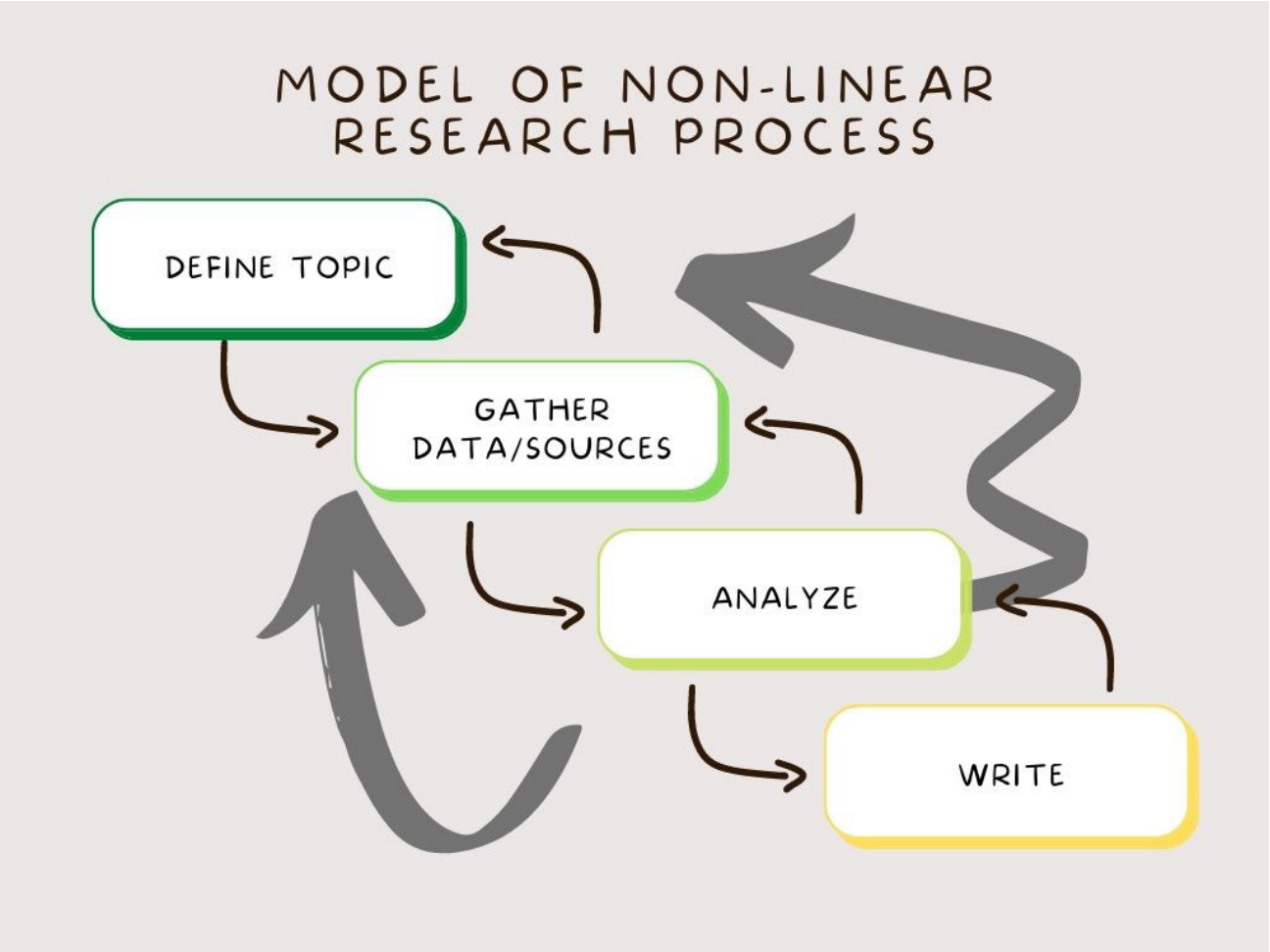

Figure 2. A model of an iterative research process. Created in Canva.

collected in a manner that is useful to the question at hand, being proprietary, or, in the case of archival materials, being unprocessed.

- Feedback with unexpected breadth: Feedback from readers can sometimes be contradictory or confusing. For example, one person might suggest cutting a section entirely while another person suggests expanding it. We recommend asking clarifying questions when possible.
- Preparation before research: The work to establish or set up research can take significant time and effort. For example, ethnographic research with any community or population often requires establishing trust and rapport to increase the quality and accuracy of results.[1] A researcher in a lab may need to develop a new procedure before being able to run their experiment. Anticipating these challenges and building them into timelines can avoid potential delays.
- Ethical issues: Researchers may inadvertently acquire data that falls outside the scope of an IRB proposal or accidentally gain access to an archival object that the creator did not intend to be public.

The myth of serendipity is an intriguing aspect of the research process we also wanted to address. We wanted to emphasize to students that moments of inspiration don't come out of nowhere; they come when a researcher is attuned to discovery because of the work they have already done. As science fiction author Octavia Butler wrote, "First forget inspiration. Habit is more dependable. Habit will sustain you whether you're inspired or not."[2] A 2016

article by Kim Martin and Anabel Quan-Haase supports Butler's advice. In interviews with historians about the use of archival materials, the researchers concluded that "historical training is critical for eliciting incidental serendipitous encounters."[3] Without their training, these historians wouldn't be looking in this place for these things or have the ability to bring them together to form new stories.

We explicitly address that setbacks will happen, even with a well-designed research plan. Experiments fail, research can be scooped, surveys fail to capture anticipated results, or a dissertation topic might have already been written about. The list of what can go wrong might seem overwhelming and frightening, but if students are unaware that these are common occurrences in research, they might see a mere setback as a crisis. Crises can in turn lead to second-guessing and insecurity. When encountering a research setback, we propose the following tips: don't panic, don't be hard on yourself, and take a little time to consider next steps. We reinforce turning to networks to find ways to move past the setback. The act of saying something aloud can help students see the big picture, discover potential ways around an obstacle, and recognize available opportunities. Sharing setbacks can also help students identify people in their networks who have experienced similar obstacles and can provide advice for managing the setback. As generic as these tips might seem, graduate students may not have heard them in this context before.

The session ends with tips and techniques to help students manage the messy research process and a list of available campus services to support them. Our tips include the following:

- Establish a schedule. Create a realistic timeline that includes start and end dates, milestones, and time to work, even if it is in small increments. Build in time to have a life outside of research.
- Know the project's limitations and opportunities. Consider financial implications, barriers to working with populations, travel, and access to materials, among others.
- Understand your skills. Identify the skills needed to complete specific research tasks. These might include learning a language, data analysis software, or to search databases. If you don't have these skills, is it possible to acquire them within the timeline? Acknowledge where you need help and seek resources to assist you.
- Develop a support network. This network might include faculty, librarians, writing tutors, student groups, and peers. These resources can help you identify support services, learn various skills and techniques, provide moral support and commiseration, or act as a sounding board for your ideas.

Outcomes and next steps

We offered the workshop three times during the 2021–2022 academic year. Through these pilot sessions, we saw that there was interest and intend on offering it regularly in the future. Specifically, participants reported finding it useful. One person characterized it as the first time anyone was "real" about the research process. This was encouraging, as we feared that the middle of the presentation was simply a list of items that could go wrong.

The feedback indicated that the workshop's content is valuable and lacking from, implicit in, or not addressed consistently in the graduate curriculum. However, workshops are a self-selecting opportunity. Going forward, we will look for opportunities to partner directly with departments, both to reach a broader swath of graduate students and to customize the

workshop to the needs of a particular subject area. In addition, we might explore hosting programs on perfectionism and "grind and hustle" culture.

Developing this workshop was a worthwhile process in and of itself. Through our reflection about the research process, we are now equipped to incorporate information about the interconnected, messy nature of research in reference consultations, instruction sessions, and even emails to faculty in our liaison departments. In addition, being curious about these processes led to a research project, now underway, which seeks to learn how faculty members describe and contextualize the research process in upper-level undergraduate courses.

At the onset, we thought that addressing the messy research process might be too unwieldy or difficult to meaningfully incorporate into other library instructional sessions. However, it only takes a few moments to convey one or two of these ideas. An opening activity, during which students partner to share their thoughts on the most difficult part of the research process, can set up the remainder of the session. We believe it is imperative that librarians tell users about these ideas. As we mentioned earlier, librarians know about these pitfalls and iterative processes, but in trying to teach "basic" literature searching skills, we fail to explicitly impart that wisdom to novice researchers who might benefit most from it.

Notes

1. Karen O'Reilly, "Rapport," in *Key Concepts in Ethnography* (London: SAGE, 2009), https://doi.org/10.4135/9781446268308.
2. Octavia E. Butler, *Bloodchild: And Other Stories* (New York: Four Walls Eight Windows, 1995).
3. Kim Martin and Anabel Quan-Haase, "The Role of Agency in Historians' Experiences of Serendipity in Physical and Digital Information Environments," *Journal of Documentation* 72, no. 6 (January 1, 2016): 1008–26, https://doi.org/10.1108/JD-11-2015-0144.