Thoughts on Synthesizing Information: A Research Skill for Our Time?

Mark Lenker

abstract: Synthesizing information from multiple sources is a crucial skill for information literacy, and it is exceedingly important for learning in the 21st century information landscape. An influential 2015 paper by Kacy Lundstrom and colleagues presents a nuanced view of research synthesis from an information literacy perspective, particularly in the rubric they propose for assessing students' synthesis in writing projects. I use the categories in this rubric to reflect on my own piecemeal work on synthesis and pose questions about how to teach this skill more effectively. My library instruction experience has primarily focused on students in undergraduate, general education courses, but the observations I share could be adapted and applied to information literacy instruction with other groups.

Why Synthesis?

Have you had the experience of working on several projects that appeared to be separate, only to discover later that they fall into a single category in a meaningful way? It is as if your unconscious mind has been directing your work from the background, only it keeps its grand plan hidden while you spend months (or years) running from one item to the next. Then, something jars your brain in just the right way, and—Eureka—you get a clearer sense of what you have been trying to accomplish all along.

I recently realized that, for the past two or three years, a major part of my teaching and research has been devoted to helping students achieve a rich *synthesis* in their research and learning. Once I used the word synthesis to label the motivation behind my work, it became clear that I should tap into the growing literature on synthesis to learn more. In this essay, I will share some of the projects I have been working on that relate to synthesis. I will also sketch out a few of the many aspects for which I still have much to learn.

There are several reasons to regard synthesis as a pivotal learning skill, especially at this point in history. Education researchers Sarit Barzilai, Asnat R. Zohar, and Shiri

portal: Libraries and the Academy, Vol. 25, No. 3 (2025), pp. 441–452

Mor-Hagani argue that, in the overabundant contemporary information landscape, information comes in a dizzying array of formats and represents a remarkably diverse set of perspectives. Learning anything coherently amid such a multiplicity of voices requires developing sophisticated synthesis skills. Furthermore, failure to synthesize multiple perspectives accurately and fairly may result in biased, shallow thinking on complex questions. A lack of synthesis skills has important implications both for learning about personal matters and for informing oneself on political questions.[1] Learning about controversial questions involves comparing different accounts and perceiving important gaps in information, and this type of learning requires synthesis.

Additionally, we are working with students at a time when it is difficult to trust information coming from official sources, especially media and government agencies.[2] In a low-trust milieu, research is seldom a matter of getting to the bottom of a question once and for all. Increasingly, a more realistic goal for research involves developing a thorough understanding of different accounts related to a question, then making an argument for an explanation or solution that seems most plausible.[3] Building one's understanding of a research question and the varying perspectives that contribute to it is a high-level synthesis challenge.

Clearly explaining the synthesis that goes into one's understanding can also help to build trust with an audience, especially when the audience's perspective differs from that of the speaker. In our age of polarized discourse, it is no longer enough just to get one's point across. Communicating across differences also requires making it clear that one has given different perspectives sincere consideration. Writing and speaking this way is more demanding than simply lining up evidence to neatly support a conclusion, but doing so is crucial if we want our conversations to break through ideological divides. It can be tempting as a communicator to skip over the work of explaining our synthesis and just get to the bottom line. But doing so deprives our discourse of much-needed examples of thorough, fair-minded thinking.

Finally, the state of the art in teaching learners to evaluate information, a skill that many consider a staple in contemporary library instruction, seems to be moving away from checklists and toward of synthesis. Checklists for evaluating sources can point out important features of information that a researcher should consider carefully, but checklists also have limitations.[4] Checklists can encourage binary thinking in terms of "good" sources and "bad" sources. Reliance on checklists may make researchers more prone to fall for disinformation by bad actors, who can also use checklists to ensure that the disinformation they create features the earmarks of legitimate information. For these reasons, many library instructors emphasize comparative strategies for evaluation, such as lateral reading and SIFT.[5] Such strategies emphasize the comparative techniques that fact-checkers use to examine new information in light of more trusted sources. But such comparisons are themselves a form of synthesis—a matter of learning from other sources to form an

Fact-checking and research synthesis involve similar skills, though they target different objectives within the research process. Instruction in one skill might help to lay the foundation for the other.

educated judgment on the reliability of a given piece of information. Fact-checking and research synthesis involve similar skills, though they target different objectives within the research process. Instruction in one skill might help to lay the foundation for the other.

In recent months, an AI summary has appeared above the list of results in most Google searches. Does Google's AI engage in a sophisticated synthesis? I have no way of knowing. But I worry that, on Google results pages, the quick answer gets the prime real estate above the long list of differing perspectives on the user's query (not that these results are always conceptually diverse, but at least they come from different places). How does this arrangement influence our expectations for learning from information? Will it become even more tempting to skip over the hard work of synthesizing information from diverse sources?

An Information Literacy View of Research Synthesis

The growing scholarly conversation about synthesis cuts across the disciplines of education, psychology, reading studies, composition studies, and library science.[6] As my initial point of entry into the literature, I chose a 2015 study by Kacy Lundstrom and colleagues.[7] These information literacy researchers investigated undergraduates' ability to synthesize research sources with a view to developing effective teaching interventions. This research group did not find much agreement in the literature on what research-based synthesis should look like, so they created a composite rubric that drew from multiple elements of existing rubrics, including the AAC&U's VALUE Rubric for Inquiry and Analysis.[8] The result is a straightforward set of categories that captures salient aspects of synthesis for an information literacy context:

- "Source variety"
- "Using information sources effectively"
- "Identifying conversations among sources"
- "Organizing sources meaningfully"
- "Analyzing sources to create something new or draw conclusions and make generalizations."[9]

In the discussion that follows, I use this rubric's categories to organize my own thinking about synthesis and how I teach it. My instruction work is mostly with undergraduates in general education classes, and the following discussion reflects that experience. By no means can I claim to have come up with a foolproof method for teaching synthesis. The techniques I share are approaches that I have tried (or that I want to try). Some have been part of class discussions that appeared engaging to me, but I have no further evidence of the methods' effectiveness. I only share these fragments in hopes that they might inspire others to form more complete ideas about how to teach synthesis.

Source Variety

For most of the first-year composition courses I have worked with, the requirements for source variety have been too vague to encourage much of a synthesis: "Find at least three scholarly sources and three popular sources. Make sure that at least one of your sources raises a counterargument against your thesis." I worry that instructions like this encour-

age student researchers to seek out only those sources that "back up" their thesis, then tack on an additional source to meet the counterargument requirement. This approach does not direct students to consider a breadth of perspectives on their research question.

To achieve a richer synthesis, it might help to identify more specific sources for students to seek out. Jane Hammons led a thought-provoking workshop on the idea of directing students to seek out specific "voices" or perspectives rather than just a required number of sources. How do researchers approach the issue in question? How do journalists write about it? Can you find the perspective of someone directly involved in the issue in question?[10]

To achieve a richer synthesis, it might help to identify more specific sources for students to seek out.

I have been working with colleagues to compose a related set of recommendations based on research advice from Aristotle.[11] According to philosopher Richard Kraut, in *Nicomachean Ethics* and other sources, Aristotle claims that the best research on ethical questions is synthesis-based.[12] Such research begins with collecting opinions on the question from people who have some claim to authority on the subject. Specialized researchers are among those who should be consulted, but Aristotle notes that researchers can easily become wedded to a particular view of their subject. It is advisable to cast the net more broadly, including people who actually work in a related field (such as craftsmen), people affected by the issue in question, and people with a reputation for having something wise to say on multiple subjects.

This is still a work in progress, but Kraut's discussion of Aristotle has inspired us to recommend that students consult a range of perspectives related to their research questions:

- Expert researchers (for evidence or argument on the question)
- People who work in a related industry (to get the perspective of someone directly involved in the matter)
- People impacted by the issue (another way of getting a more direct perspective)
- Shapers of public opinion who comment on the question (a political or media figure may not be an expert on the question, but they have a significant influence on how people feel about the issue and its importance).

According to Aristotle, putting these different perspectives in conversation with one another creates a puzzle for the researcher, which makes it necessary to carefully evaluate the claims of each to determine what may or may not be plausible. Does the media figure's commentary on an issue actually mesh with people's lived experience? How does a researcher's perspective on a question compare with that of someone in a line of work that engages with the question on a practical level? I want this synthesis-puzzle experience for our students, when disagreements among the authorities make the student look up and say, "Wait, what's really going on here?" That's when research becomes less procedural and more about genuinely facing a question.

Using Information Sources Effectively

If achieving source variety requires strategy when searching for information, using sources effectively requires strategy in reading or listening to information and strategy for writing about what you learn. But does the question of how students use sources fall outside the scope of the normal work of an instruction librarian?

I tend to devote a lot of time in one-shot classes to search techniques and strategies for evaluating information, though my recurring concerns about synthesis have me questioning these priorities. Furthermore, in my experience with one-on-one research consultations and other reference interactions, it is not uncommon to field student questions along these lines: "Ok, once I have found my six sources, what am I supposed to actually *do* with them?" I do not always have very helpful answers to these questions, but I would like to do better in this regard. Over the years, I have developed some good habits for incorporating other perspectives into my own writing, but this experiential learning does not automatically translate into facility in explaining such skills to others. I sense undeveloped potential in my work with students in this area.

I tend to devote a lot of time in one-shot classes to search techniques and strategies for evaluating information, though my recurring concerns about synthesis have me questioning these priorities.

I have only just started exploring this possibility, but a promising way for librarians to support students in using information effectively is to help them develop strategies for taking useful notes on the information they are learning from. I speak from experience – good note taking strategies make it much easier to synthesize information into one's subsequent writing. Over the past few years, I have explored a few approaches to make my own note-taking more efficient and useful.[13] One of the techniques that I use in my own note-taking routine is the Cornell Note Taking System.[14] While students frequently hear about this method as a way to take useful lecture notes, it also has advantages for note-taking in research, and it is not very hard for an instructor to explain.

The Cornell method requires the note-taker to divide their page into three sections:

1) A large field to the right of the page for taking notes while reading. Ideally, this space is used for paraphrasing main ideas and reacting to the text, but it can also be used to take down important quotes or statistical information.
2) A narrow column on the left of the page for raising questions about the notes in the right-hand field. Posing questions in this manner is another way to express what is important about the notes on the left. The questions on the left also help the note-taker navigate the notes on the right when it is time to review and use the content of the notes—the questions indicate what each section of the notes is about.
3) The bottom fifth of the page is reserved for the note-taker to summarize the gist of the notes above in their own words. This summary provides the note-taker another opportunity to write about the most meaningful points in the content on the page. The note-taker should write the summary carefully—it should explain

the significance of the notes in a way that will make sense to the note-taker in the future.

In practice, the note-taker would compose their notes in the large, top-right field as they read or shortly after they read. Once they have finished (or, even better, after a short break), they go back to fill in the left-side question column and the summary field at the bottom. For best results, quotes should be kept to a minimum—it is best for the note taker to express the important ideas in their own words.

How does the Cornell method help note-takers use information in a way that contributes to effective synthesis? Note-takers express what they are learning in three different ways: in their running notes, in the questions column, and in the somewhat formal summary. This repetition gives the note-taker opportunities to check and refine their understanding of the text they are reading. Better comprehension contributes to a clearer sense of how a single source fits into the mix of sources that a researcher consults.

Equally important, the Cornell method gives the note-taker three opportunities to practice writing about what they are learning. This iterative practice is especially effective if the note-taker commits to writing out their ideas in their own words as much as possible. Ideally, the summary piece at the bottom of each page will be especially clear and meaningful. In some cases, with minor adjustments, the summary statement will be ready for inclusion in the note-taker's paper or presentation.[15]

Researching with a note-taking system like the Cornell method front loads a considerable portion of the work of research and writing. Such note-takers spend time digesting and expressing the ideas they are encountering, and this slows the research process down considerably, especially compared to less intensive methods like highlighting important passages or scribbling brief notes in the margins of research texts. But this extra time makes it much easier for note-takers to express their ideas in their formal writing—they have put in the work required to genuinely understand what they have read, and they have already practiced writing about it. This work in advance makes it easier to use information from research sources clearly and accurately.

Organizing Sources Meaningfully

Teaching someone to organize sources for research is much like teaching someone to tie their shoes: it can be much harder to explain the skill than it is to master the skill. I have developed a classroom activity to help students warm up their synthesis muscles before we enter deep discussion about how to organize research sources in a meaningful way. So far, I have used this activity in an undergraduate workshop on literature reviews and with a group of students who were analyzing media coverage of international conflicts. It could be adapted to other instructional scenarios as well.

Teaching someone to organize sources for research is much like teaching someone to tie their shoes: it can be much harder to explain the skill than it is to master the skill.

I prepare for the activity by finding sample sources for students to practice with. Newspaper headlines are perfect for this: they are typically detailed enough for students

to pull meaning from, but not so long that students get bogged down with reading difficult text. When I tried this, I printed out 25 newspaper headlines from the *New York Times,* retrieved through a search for "artificial intelligence." I gathered headlines on a range of topics—anything would do as long as the headline mentioned AI, and the headline made sense even when separated from the body of the article. Favorite headlines include "How the A.I. that Drives ChatGPT Will Move into the Physical World" (creepy) and "When A.I. Bridged a Language Gap, They Fell in Love" (heartwarming, I think?). Once I printed my list, I cut the list into strips that students could organize into groups (for most classroom settings, you will probably need several copies).

Early in the class session, after only a brief overview of the agenda for the day, I ask students to break into groups of two or three and give them these directions:

- Organize the newspaper headlines by topic. Make piles of similar headlines.
- You should have 4 or more categories. No more than 10 categories.
- If you get stuck on a headline, set it aside and come back to it later.
- Take approximately 10 minutes for this.
- It's just practice—don't freak out!

After 10 minutes have passed, we reflect on the exercise as a class. I ask students whether they thought this was easy (so far, they have not). I ask a couple of teams to share their categories, and students typically come up with good ones (AI and human-interest stories, AI in the workplace, tales of AI doom). Then, to really get the students thinking, I ask which aspects of AI and society are missing from the headline coverage. The conversation slows down at this point, but inevitably someone has some good ideas for this. For example, both groups I have worked with have mentioned the energy consumed by AI systems, which involves both financial and environmental ramifications.

This activity gives students experience with three aspects of organizing information: separating the information into thematically similar clusters, coming up with labels so that they can discuss their categories, and extrapolating from their list of categories to identify meaningful categories that are not represented. Practice with this kind of conceptual work makes it easier to discuss how to bring sources into conversation with one another. In fact, this exercise serves as an excellent warmup for discussing synthesis matrices, which I address in the next section.

Identifying Conversations among Sources

In their rubric, Lundstrom and colleagues assess student papers for evidence of explicit and implicit techniques that writers use to bring sources into conversation with one another, either through language used to indicate comparisons ("alternatively," "likewise") or through the positioning of source references in relation to one another.[16] In my instruction, I emphasize organizing sources and ideas into a matrix to make such comparisons easier to visualize before students start writing.

To give students a detailed example of how a research synthesis works, I typically link to the classic handout "Writing a Literature Review and Using a Synthesis Matrix," by North Carolina State's Writing and Speaking Tutorial Services.[17] It shares the perfect amount of detail for a student to really understand the process of research synthesis

after about 15 to 20 minutes of careful reading. This is a significant chunk of time in a one-shot class, so I typically share this handout as an asynchronous resource.

For discussions in class, I like to introduce the idea of the synthesis matrix with a very simple, familiar example. I ask students to imagine that they are trying to decide whether to attend UNLV (a decision they actually faced no more than a few semesters ago), and that so far, through various recruiting documents, they have gathered information from the university president, the athletic director, the library, a political science professor, and the admissions office. These individuals and offices are listed at the top of the columns in our sample matrix, along with a sixth box that is left open. The rows are labeled with topics that might influence a student's decision: diversity, sports, research opportunities, affordability, and a fifth box that is left open. The various boxes in the body of the table contain brief, hypothetical messages that the stakeholders might mention. Students can see that the president tends to emphasize strategic priorities, while the admissions office provides hard data on diversity and affordability. The library boasts of a comprehensive collection to address research needs, while the political science professor wishes the library carried more political science journals. The messages are short and exaggerated—the point is to show that the matrix makes it easy to see points of agreement and areas of disagreement among the stakeholders in our hypothetical question, and that a similar matrix can help students track agreement and disagreement among their research sources (see Table 1).

The blank boxes for stakeholders and topics are especially important. A key element of research synthesis is identifying what is missing from the conversation as areas for further research. When I ask students which perspectives the matrix does not include, they are typically quick to realize that, for example, students, alumni, and local employers are not represented. The topics for discussion include similar gaps: there is no mention of social opportunities, housing options, and so on. I encourage students to recognize gaps in their own research, areas that they might want to learn more about if they had the time and expertise. No one expects them to cover absolutely everything during a semester-long project, so there is no reason not to explicitly mention directions for further research in their work. Professional-grade scholarly studies frequently identify areas for further research—students should share that aspect of their research synthesis as well.

Analyzing Sources to Learn Something New

I do not have any suggestions for teaching strategies that fall under this heading; I only have a question that gnaws at me when I reflect on my work. If we are asking students to make meaningful syntheses to learn new things, it stands to reason that students would need to have a solid understanding of the sources they are synthesizing. I worry that I do not always lead students to sources that they can actually comprehend.

I frequently recommend that first-year students start their research with popular sources—a magazine or a book for a popular audience is typically easier to comprehend for newcomers than highly technical scholarly journals are. If students begin by building their background about their topic from approachable sources, perhaps they will have greater success interpreting more scholarly sources later in their research.

Table 1.

Sample Synthesis Matrix: Is University of X a good university to attend?

	Source #1 -- President's Office	**Source #2 -- Athletic Director**	**Source #3 -- Library**	**Source #4 -- Political Science Professor**	**Source #5 -- Admissions Office**	**Source #6 --**
Main Idea A: Diversity	U of X prides itself on the diversity of its student body.				U of X students are 15% this group, 20% that group, etc.	
Main Idea B: Sports	New stadium means new opportunities for recruiting and events.	Incredible success in recruiting athletes -- will be an amazing year.				
Main Idea C: Research Opportunities	U of X earned highest designation for research activities.		Library collections support all research needs.	Library is solid; I wish they had more political science journals.		
Main Idea D: Affordability	Affordability is a guiding principle of our strategic plan.				Tuition costs x, average cost for books is y, etc.	
Main Idea E:						

Different stakeholders offer different perspectives on U of X. Students give suggestions for Source # 6 and Main Idea E to provide additional perspectives.

If students begin by building their background about their topic from approachable sources, perhaps they will have greater success interpreting more scholarly sources later in their research.

Like I said, I make this recommendation frequently, but it almost never seems to land. If I give students time to search on their own at the end of a class session, they almost always begin right away with the hunt for journal articles. The same is true in research consultations—there is seldom much interest in magazine articles or introductory books (though students tend to get pretty excited if there is a *CQ Researcher* report for their topic).

Am I underestimating early-career students' capacity to understand journal articles? I do not want to stand in their way if they are indeed ready to learn from highly specialized research studies. But I do feel that first- and second-year students would stand a better chance of comprehending what they are reading if they included a higher proportion of reference and journalistic sources in their research. Presumably, better comprehension would lead to more meaningful synthesis. This is an area for further research and discussion with faculty collaborators. How can we craft assignments that result in sophisticated syntheses of sources that students can actually comprehend?

For Further Research

In their systematic review of the literature on teaching synthesis, Barzilai, Zohar, and Mor-Hagani identify several directions for further research. Noteworthy questions include:

- Do students understand the point of synthesizing information from more than one source? Why is seeking out a synthesis of sources more desirable than relying on information from a single source?[18] Undergraduate students may understand the point of synthesis on a conceptual level, but does this understanding guide their real-world information choices? How do students determine when to pursue multiple perspectives and when to be satisfied with a few easily available sources?
- What sorts of prompts are best for encouraging students to perform meaningful syntheses? What language is best for directing students to select relevant information, organize that information, and identify and describe connections among different sources of information?[19] What difference would it make if instructions included a sample synthesis matrix?
- How does writing annotations and summaries of sources prior to synthesizing them make a difference in the quality of the resulting synthesis?[20] In my personal experience, note taking strategies that emphasize restating ideas in your own words make subsequent synthesis much easier. How broadly does this apply to other researchers?

In addition to these questions, I would like to know more about collaborative strategies to involve the library in teaching synthesis. Studies by Lundstrom and colleagues

and by Alexandria Chisholm and Brett Spencer both focus on collaborations between librarians and composition faculty to assess student work. The resulting assessments left librarians in a good position to collaborate on developing meaningful teaching interventions.[21] Are there other examples of librarians and classroom faculty working together to devise teaching strategies for research synthesis? How have these two groups worked with writing center colleagues to develop instruction and support for skills like note-taking, devising synthesis matrices, and bringing sources together in conversation?

Information synthesis may be a research skill for our time, but it is easy to lose sight of it, especially in library instruction and reference work, where it is tempting to deprioritize synthesis and concentrate on search techniques and evaluation strategies. But the point of search and evaluation is to build a rich, meaningful synthesis that stimulates significant learning. We need to help students understand the goal of learning through research: bringing different ideas together to arrive at something new.

Mark Lenker is a teaching and learning librarian at the University of Nevada, Las Vegas, email: mark.lenker@unlv.edu, ORCID: 0000-0002-5851-6769.

Notes

1. Sarit Barzilai, Asnat R. Zohar, and Shiri Mor-Hagani, "Promoting Integration of Multiple Texts: A Review of Instructional Approaches and Practices," *Educational Psychology Review* 30, no. 3 (2018), pp. 973–999, https://doi.org/10.1007/s10648-018-9436-8.
2. "Assessing the News Media: Trust, Coverage, and Threats to a Free Press," AP-NORC Center for Public Affairs Research, May 1, 2023, apnorc.org/projects/assessing-the-news-media-trust-coverage-and-threats-to-a-free-press/; Brian Kennedy, Alec Tyson, and Cary Funk, "Americans' trust in scientists, other groups declines," Pew Research Center, February 15, 2022, https://www.pewresearch.org/science/2022/02/15/americans-trust-in-scientists-other-groups-declines/.
3. Mark N. Lenker, III, "Dwindling trust in experts: A starting point for information literacy," *Communications in Information Literacy* 17, no. 2 (2023): 554–572, https://doi.org/10.15760/comminfolit.2023.17.2.12.
4. For a very influential piece on the limitations of checklists, see Marc Meola, "Chucking the Checklist: A Contextual Approach to Teaching Undergraduates Web-site Evaluation," *portal: Libraries and the Academy* 4, no. 3 (2004): 331–344, https://10.1353/pla.2004.0055.
5. Sam Wineburg and Sarah McGrew, "Lateral Reading and the Nature of Expertise: Reading Less and Learning More When Evaluating Digital Information," *Teachers College Record* 121 (November 2019): 1–40; Mike Caulfield, "Information Literacy for Mortals," PIL Provocation Series, 1(5), December 14, 2021, Project Information Literacy Research Institute, https://projectinfolit.org/pubs/provocation-series/essays/information-literacy-for-mortals.html.
6. For thought-provoking reviews of this research literature across disciplines, see Barzilai, Zohar, and Mor-Hagani, "Promoting Integration of Multiple Texts"; and Liselore van Ockenburg, Daphne von Weijen, and Gert Rijlaarsdam, "Learning to Write Synthesis Texts: A Review of Intervention Studies," *Journal of Writing Research* 10, no. 3 (2019):402–428, https://10.17239/L1ESLL-2021.21.01.06.
7. Kacy Lundstrom, Anna R. Diekema, Heather Leary, Shari Haderlie, and Wendy Holliday, "Teaching and Learning Information Synthesis: An Intervention and Rubric-Based Assessment," *Communications in Information Literacy* 9, no. 1 (2015):60–82, https://10.15760/comminfolit.2015.9.1.176.

8. "VALUE Rubrics – Inquiry and Analysis," American Association of Colleges and Universities, 2024, https://www.aacu.org/initiatives/value-initiative/value-rubrics/value-rubrics-inquiry-and-analysis.
9. Lundstrom et al., "Teaching and Learning Information Synthesis," 68, 72. Note that this is not the only way to organize one's thinking about teaching synthesis. In a systematic review of teaching strategies for synthesis in writing, "Learning to Write Synthesis Texts," van Ockenburg and colleagues distilled the following design principles for interventions to teach synthesis: (a selecting relevant information, (b) organizing information by *feature* (author, date, format, etc.), (c) organizing information by *content* (main ideas, solutions proposed, etc.), and (d) making connections among ideas and information gathered (p. 413 et passim). These design principles could also serve as headings for an investigation into the research literature on teaching synthesis.
10. Jane Hammons, "Voices Not Sources: Reframing How We Teach Searching for and Evaluating Sources," Ohio State Teaching Information Literacy Workshop (Virtual), October 24, 2024.
11. Mark Lenker, "An Ancient Research Strategy for Contemporary Controversies," *Informed Librarian Online*, July-August 2024, https://www.informedlibrarian.com/index.cfm. Thanks to Chelsea Heinbach, Rosan Mitola, and Amber Sewell for helpful discussions on how to incorporate this idea into our teaching practice.
12. Richard Kraut, "How to Justify Ethical Propositions: Aristotle's Method," *The Blackwell Guide to Aristotle's Nicomachean Ethics*, ed. Richard Kraut (Blackwell Publishing, 2006), 76–95.
13. Mark Lenker, "Information is everywhere—is it still important to take notes?" *The Human Relationship with Information* (Routledge, forthcoming).
14. See "The Cornell Note-taking System," The Learning Strategies Center, Cornell University, accessed November 21, 2024, https://lsc.cornell.edu/how-to-study/taking-notes/cornell-note-taking-system/; and Walter Pauk and Ross J.Q. Owens, *How to Study in College*, 11th ed. (Wadworth, 2014), 261–285, 366–68.
15. Whenever truly useful gems turn up in my Cornell notes, I enter the ideas into a system of notecards called a Zettelkasten. The Zettelkasten provides notes for long-term use over multiple projects. The Zettelkasten method may be too involved for most undergraduate work, but as students embark on capstone projects or begin to prepare for graduate school, it makes sense to consider a long-term notes system like a Zettelkasten. For a comprehensive explanation of the Zettelkasten system, see Sönke Ahrens, *How to Take Smart Notes: One Simple Technique to Books Writing, Learning, and Thinking* (Sönke Ahrens, 2022).
16. Lundstrom et al., "Teaching and Learning Information Synthesis," 72.
17. Laura Ingram, James Hussey, Michelle Tigani, and Mary Hemmelgarn, "Writing a Literature Review and Using a Synthesis Matrix," NC State Writing and Speaking Tutorial Services, 2006, retrieved from https://guides.library.vcu.edu/lit-review/document.
18. Barzilai, Zohar, and Mor-Hagani, "Promoting Integration of Multiple Texts," 993–94.
19. Ibid.
20. Ibid.
21. Lundstrom et al., "Teaching and Learning Information Synthesis,"; Alexandria Chisholm and Brett Spencer, "Through the Looking Glass: First-Year Composition through the Lens of Information Literacy," *Communications in Information Literacy* 13, no. 1 (2019), 43–60, https://10.15760/comminfolit.2019.13.1.4.