

Comparing the Impact of Physical and Digitized Primary Sources on Student Engagement

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abstract: One long-held belief in archival education is that physical primary sources engage students more effectively than digitized sources do. This investigation questions that belief by analyzing whether and to what extent the format of a primary source impacts student engagement and learning, using a controlled study of students in a business ethics course. The findings suggest that, in instruction requiring the rhetorical analysis of a primary source, digitized primary sources may engage and contribute to student learning just as effectively as physical sources. These findings have significant implications for primary source pedagogy.

Introduction

In their 2019 analysis of the literature on teaching with primary sources, Patrick Garcia, Joseph Lueck, and Elizabeth Yakel note that “exposing students to the ‘magical awe’ of working with analog archival materials [has been] a key engagement strategy” of librarians. Indeed, this belief underlies the most common outreach strategy of archives. This approach, based on the assumption that the physical is superior to the digital, holds that physical primary source materials naturally engage students better in learning and hold their attention longer than digitized primary source materials. This article questions this long-standing belief by presenting research that addresses whether students learn or engage differently when interacting with digital or physical primary source materials. The findings show that when students are asked to rhetorically analyze primary sources, the format of the sources has no discernible impact on their learning and engagement levels.

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some approaches that may be used to design modes of instruction that center on and are informed by digitized objects.

These findings have potentially wide-ranging implications for primary source education and pedagogy. They suggest that digitized sources can be scaled up to engage greater numbers of students with primary source materials, addressing many of the challenges faced by archives and repositories that are bounded by space or staffing limitations, or that face institutional pedagogical changes to online or hybrid instruction. The findings also point to

Literature Review

Literature on the assessment of student learning in archives and special collections remains a relatively nascent area of study. For example, while García, Lueck, and Yakel's article provides a thorough literature review of the pedagogical history of archives and special collections, many of the sources that comprise this history provide little guidance on or concrete strategies for assessment.² Most of the literature in this area delineates the importance of primary source literacy and provides models for it.³ Literature explicitly addressing the evaluation of student learning does so within the context of students' use of physical primary sources.⁴

While some articles address pedagogy and student learning in the context of digital sources, the potential role or impact of the format is often overlooked.⁵ Instead, much of the literature about digitized primary source collections focuses on either the role of such collections in K–12 education or the challenges associated with creating, navigating, and teaching with them.⁶ In K–12 educational settings, large digitized collections are

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often the only primary source option for teachers and students, as they seldom have access to a physical archive. Teachers may utilize, for example, the American Memory Project, a collection of historical resources, or the Digital Public Library of America (DPLA), a free discovery tool that provides access to digital collections and archives. Thus, much of the literature in this area also includes case studies about teachers' creation and use of digitized "document packets" of primary source materials, as well as teaching strategies for using these materials, rather than analyzing what students learn.⁷ In the

realm of higher education, some authors identify additional challenges associated with primary sources. For example, the team of Peter Wosh, Janet Bunde, Karen Murphy, and Chelsea Blacker discusses how an archive's limited hours and staffing can affect student access. Alexandra Chassanoff notes scholars' needs for greater contextualization of digitized primary sources, specifically detailed descriptions of the collections within



the online finding aid (such as notes about provenance) and assurances that they are accessing the entire collection.⁸

Notably, some scholars have identified the importance of regarding digital collections as distinct from their printed counterparts in terms of their affordances—for example, their potential to be shared and disseminated more widely than physical primary sources. Digital materials thus require pedagogical approaches that align with the digital medium.⁹ Teachers and librarians should design sessions that consider the digital medium through which primary source materials are constituted.¹⁰ The findings of this study strongly suggest, however, that in the case of instruction requiring a rhetorical analysis of a primary source, digitized sources can engage and contribute to student learning just as effectively as physical sources can. Indeed, research comparing students' reading comprehension of print and e-textbooks provides one analogous body of literature to draw on when researching the impact of a primary source's format on student learning—a point described in the "Results" section.

Given the challenges surrounding digitized collections of primary sources—their creation, discovery, and use, and the pedagogical strategies required to successfully teach with them—as well as the impact these challenges likely have on student engagement and learning, it seems vital to address the role that format plays in a student's engagement with and understanding of a primary source. As noted earlier, this gap in the literature surrounding student learning in relation to primary sources may point to the implicit and long-held belief that physical primary sources are inherently superior to digitized sources because they can engage students' attention and spark learning in ways that digitized sources cannot. Another common assertion is that digitized collections are too selective or too removed from context compared with physical collections. This contention elides the fact that physical archival collections are themselves institutionally determined and sanctioned, consisting of decontextualized or recontextualized groups of materials selected by archivists and librarians. This study seeks to challenge this potential implicit assumption of the superiority of physical primary sources and address the gap in the literature by analyzing whether and to what extent the format of a primary source impacts student engagement and learning.

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Methodology

In the fall of 2017, a faculty member in the Kelley School of Business at Indiana University Bloomington contacted the Department of Teaching and Learning because she was interested in incorporating primary sources into her spring 2018 course in business ethics. As a business law specialist, she had limited experience using primary sources for scholarly purposes but felt that they could enhance students' understanding of ethics by engaging them with materials about the history of women's campus experiences at the university.



Because the faculty member would teach two sections of the same class in business ethics, the authors quickly realized the potential for a controlled research study to examine questions about student engagement and learning. The immediate goal was to gauge students' levels of engagement and assess their learning. A larger goal was to collect data that might provide context for making strategic and evidence-based decisions on when, whether, and under what circumstances digital and physical primary sources might be best used in the classroom, given the time, scale, and resource limitations of primary source collections.¹¹ With these goals in mind, the authors developed the following research questions:

1. Do students engage with primary sources differently when the materials are presented in a digital versus physical format?
2. Do students learn differently when primary sources are presented in a digital versus physical format?

The authors, the university archivist, and the faculty member worked together to select materials relating to women's historic experiences on campus. Then the authors collaborated with the faculty member to create a case study assignment that students would complete while interacting with the primary sources. They sought to design an assignment that would incorporate elements of the Association for College and Research Libraries (ACRL) Guidelines for Primary Source Literacy¹² and that would foster each student's ability to interpret primary source materials at a basic level. The assignment also needed to meet the course's learning objectives—connecting primary sources with the institutional policies, stakeholder perspectives, and ethical frameworks of a historical period. To this end, they crafted a series of questions promoting a rhetorical, guided-inquiry approach for students to use in class as they engaged with their given primary source. The assignment questions were as follows:

1. What kind of document are you looking at? When do you think it was created? Why do you think it was created? Give a brief description of what is going on in this document.
2. What perspective(s) are present in the document? Who do you think the audience for this document is? What do you think was going on in the culture/time this document was written?
3. After reading this document, imagine you're a female student at the time this document was published. How do you think you might have felt about these policies? How would you feel about these policies if you were a male student at the time?
4. How far have we come, or not come, as a result of these policies? Have these policies done what they intended to do? What could be some unintended consequences of these policies that are playing out now in our time?
5. What pressures were on those in charge of students, such as the president and trustees, in making the policies (or changing them when they were unpopular)? If you were in charge, what pressures do you think would have been the hardest to resist?



6. Can you defend a policy you saw today under one of the ethical frameworks we've studied? Would any framework say these policies are wrong?
7. In what ways does Indiana University still treat women and men differently? Are any of those things unethical in your view?

Both sections of the class followed the same lesson plan, with two unavoidable differences. In keeping with archival practices, students using the physical primary sources were asked to leave their backpacks, food and beverages, and pens to the side of the room, although they could use phones, laptops, and pencils. Students engaging with digitized primary sources used their own devices and had no restrictions on food, drink, or writing implements. Second, each class met in different settings. The one working with physical primary sources worked in a large room in Wells Library at tables arranged to facilitate small group work. The students working with digitized sources met in their usual classroom, a moderately sized lecture hall with tables arranged in concentric half-circles, with enough space between each circle for students to turn around and work in small groups. Both classes included introductory archival instruction from the university archivist as well as a closing discussion facilitated by the faculty member about the relationship of the primary sources to the course topics. Students in both classes worked on the assignment in small groups during class, which was due at the end of class.

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To quantify students' skills and interpretive abilities with the primary sources, the researchers developed two rubrics: one to assess students' engagement with primary sources during class, and the other to assess their learning outcomes from the assignment. Although there is little literature on the assessment of engagement for the purposes of learning, one of the authors found some guidance in a study examining early readers in a K-12 setting and used this methodology as inspiration to develop a rubric.¹³ She developed the engagement rubric to define positive and negative observable behaviors for engagement with primary sources. To apply the engagement rubric, the authors recruited three observers for each section. Since each class was about 50 students working in small groups, it was necessary to divide the class into portions and assign an observer to closely watch each group. Dividing the class into small portions kept observation manageable and accurate, creating full, attentive coverage. An observer who saw a listed behavior marked the appropriate column on the rubric regardless of whether that student had exhibited the behavior before. For example, if a student exclaimed, "Wow!" and a few minutes later the same student said, "Hey, look at this!" both positive engagement indicators were recorded. Additionally, each observer was encouraged to note other observances, interpretations, and questions on the rubric. The authors used the rubric to tally results of observed behavior and to compare positive and negative indicators between sections.



BUS L-375 Business Ethics Engagement Rubric SECTION _____

Positive Indicators	TALLY	Negative Indicators	TALLY
In small groups students exchange lots of questions/ comments with each other.		In small groups students are mostly quiet and passive; they seek direction from the teacher.	
Students seem curious and self-directed in groups.		Students distracted by something unrelated to the task.	
Students demonstrate high degree of curiosity (smiles, exclamations, questions) when engaging with the materials.		Students seem uninterested in engaging with the materials (scrolling through scans, flipping through materials without reading).	
When reporting out, students offer questions and comments.		When reporting out, students have to be prompted for responses.	
Students respond positively to the format / presentation of the materials.		Students express frustration about the format / presentation of the materials.	
		Students seem to have technical issues (e.g., problems getting to the box folder).	

Other observations of note (use back if necessary):

Observer name _____

Figure 1. The rubric used to assess students' engagement with primary sources during class.

The authors developed the second rubric to assess students' learning outcomes, drawing on both the ACRL's Guidelines for Primary Source Literacy and its Framework for Information Literacy for Higher Education. The authors identified several elements from the primary source guidelines, as well as dispositions from the frames "Authority Is Constructed and Contextual" and "Research as Inquiry," using these to form the criteria and the indicators of the rubric.¹⁴ While the assignment was developed with the primary source guidelines as the principal resource, the learning outcomes rubric maps easily to the ACRL's Framework and is therefore effective at assessing information literacy outcomes as well. Once students completed the assignment questions, the faculty member collected the assignments, scanned them, and gave them to the researchers for analysis. The authors first normed the rubric and then individually applied it to the completed assignments. They then met to review scores for each assignment and analyzed the data using Excel.

Primary Source Literacy Rubric

	4	3	2	1
Identify source materials (Authority Is Constructed and Contextual)	Identifies key components of source material including what is it, who created it, and why.			Does not identify any key components of the source material.
Evaluate perspectives (Authority Is Constructed and Contextual)	Evaluates perspectives of the creator(s) including tone, subjectivity, and biases and relates these to the original purpose and audience of the source.			Does not consider perspectives present in the source. Does not relate to the original purpose and audience of the source.
Apply context (Information Creation as a Process)	Applies knowledge of the time, culture, creator, format, genre, and publication history to situate source in context.			Does not apply contextual knowledge to situate source in context.
Identify silences (Information Has Value)	Identifies, interrogates, and considers the reasons for silences, gaps, contradictions, or evidence of power relationships.			Does not identify silences, gaps, contradictions, or evidence of power relationships.
Historical empathy (Authority Is Constructed and Contextual)	Demonstrates historical empathy, curiosity about the past, and appreciation for historical sources and historical actors			Does not demonstrate historical empathy, curiosity, or appreciation for history

Figure 2. The rubric used to assess students' learning outcomes in primary source literacy from the assignment.

Results

Regarding students' engagement with physical and digitized materials, positive indicators for both groups were high, with students in each group exhibiting a significant degree of curiosity and conversation with one another. While the engagement indicators were comparable between the physical and digital format groups, there was a discernible difference in negative indicators in the group using digitized sources with regard to distraction. Students in the digital group used their own mobile devices, and observers noted 37 instances of students checking social media and other websites during class. The researchers attributed this difference to the inherently distracting nature of multiuse digital technology.¹⁵ Overall, however, they found a statistically negligible difference in both positive and negative engagement indicators between the two groups.

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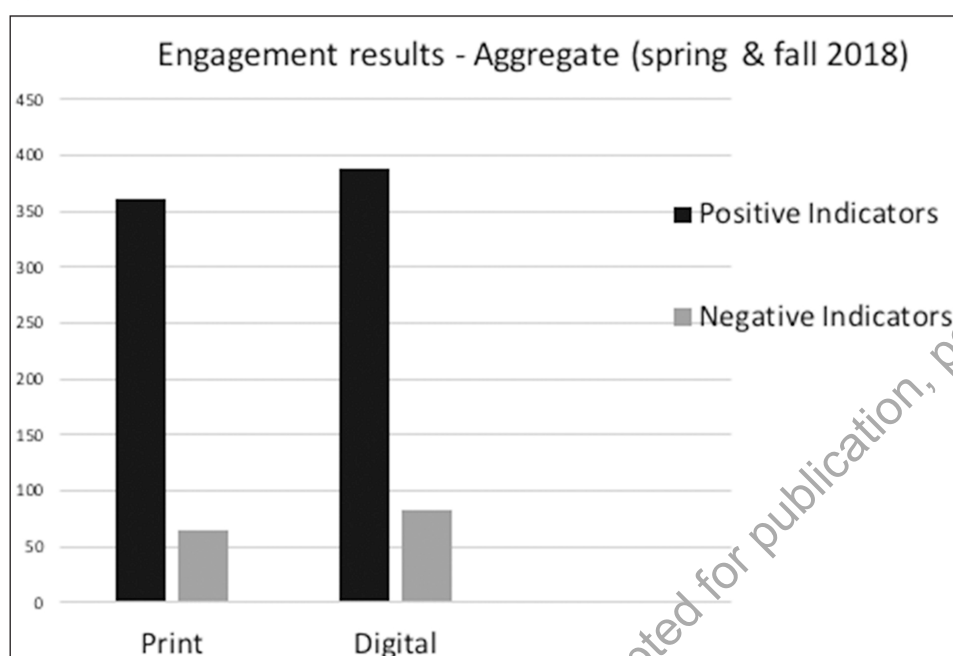


Figure 3. Results comparing engagement with print versus digitized primary sources, aggregate from the spring 2018 and fall 2018 semesters.

When comparing student learning in each group, the results revealed that the extent of learning was comparable in all areas of the rubric. Both when examining how well students performed overall and within each of the individual criteria, the format in which the primary source was presented did not show any significant difference in students' learning.

The minimal difference in learning and engagement based on format mirrors findings conducted with students in gauging their reading comprehension when using e-textbooks versus traditional print textbooks. These studies show that reading an e-text takes students longer due to distraction on digital devices but does not affect learning outcomes overall.¹⁶ Given these studies about the impact of e-text versus print text on student learning, in addition to the findings from this project, the authors conclude that the format of a source does not significantly affect student learning or engagement in circumstances similar to the one presented here.

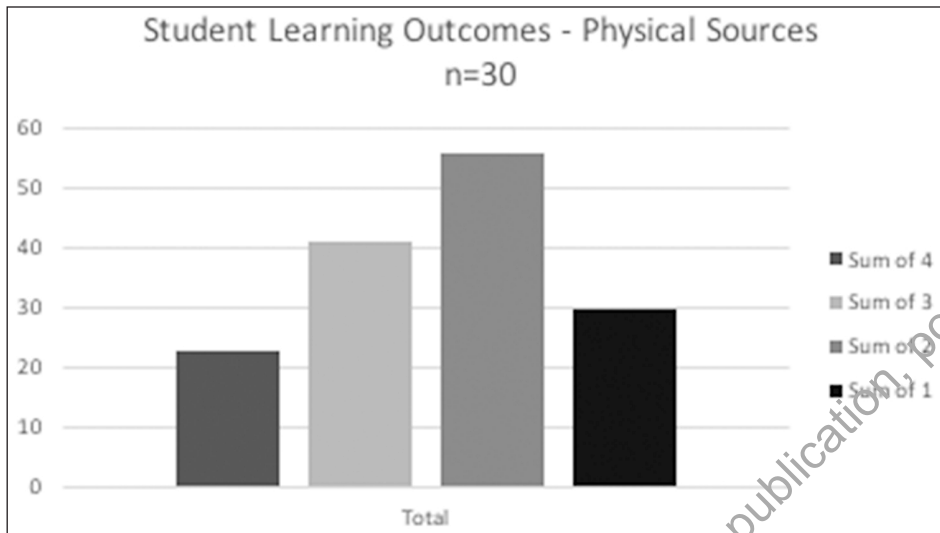


Figure 4. Student learning outcomes with physical primary sources.

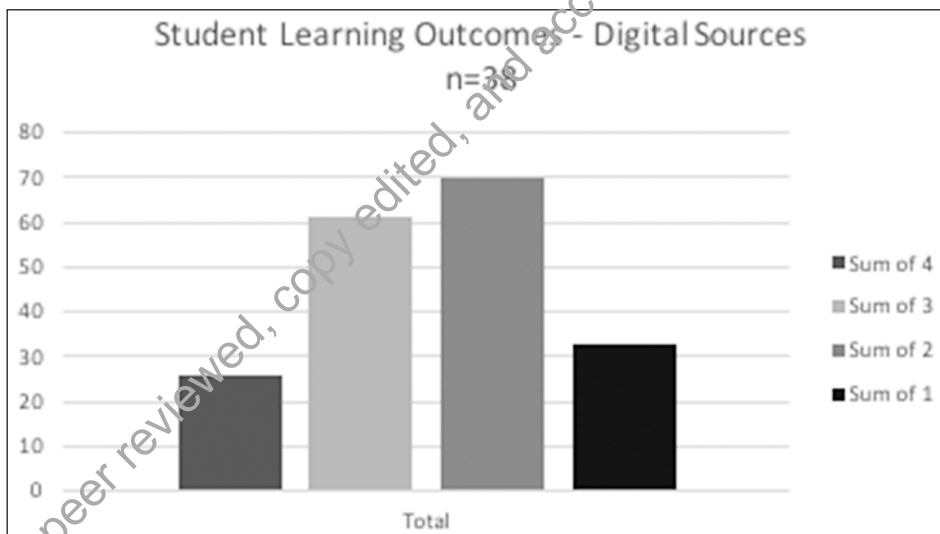


Figure 5. Student learning outcomes with digital primary sources.

Discussion

Although the mandate to increase student engagement is pervasive in higher education, methodologies for assessing engagement in learning activities are largely absent from the literature. The dearth of literature in this area is compounded by the varied and multifaceted use of the word *engagement* in higher education. By specifically defining learning engagement indicators, the researchers hoped to create experimental parameters



that would produce a clear snapshot of classroom engagement. They also recognized that using a rubric to observe students' engagement is an inherently subjective endeavor. For example, observers were instructed to apply the rubric in such a way as to accurately represent their impressions of the class engagement, but these impressions were invariably swayed by an observer's perception of what positive and negative engagement look like. The results are also affected by an individual's ability to observe a number of student groups at the same time. While the authors attempted to quantify observations, they acknowledge that the application of the rubric is dependent on the individual using

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the rubric and the circumstances of each class. Nevertheless, the development and use of the engagement rubric may provide a workable methodology for assessing students' engagement.

More importantly, the researchers acknowledge that the subject matter and assignment for this course influenced the results. In business ethics, primary source materials play a less central role in the understanding of course content than they might in a history course, for example. Additionally, the assignment required students to analyze the rhetorical features of written content in primary sources but

not their material forms—an element that, if included, would certainly influence results. In short, these results would not apply to instructional situations in which the primary sources are a core of course content or in which the materiality of the objects is critical to their interpretation. Yet in instances when the use of primary sources is largely a device for sparking thinking and questioning, and the assignment requires rhetorical analysis, the results show that digital and physical sources produce remarkably similar results in student learning and engagement.

Conclusion

For archives and special collections with limited staff and resources, these findings may illuminate a path forward for integrating primary sources into coursework without sacrificing learning or engagement. Perspectives from faculty, archivists, and students show that the availability of the physical archives and personnel can affect student experience and learning in the classroom.¹⁷ Issues regarding search interface functionality and the lack of context for the materials remain barriers to the use of large digitized collections in the classroom.¹⁸ Nevertheless, digitized collections—even “one-off” scans meant for only one or a few sessions with students—can provide broader access to primary source materials. When chosen in collaboration with librarians and archivists, digitized collections can provide quality learning and engagement experiences for students and faculty in circumstances when limitations—including little or no access to physical collections, inadequate staffing, and shortage of time—may prevent the use of primary sources in the classroom.



Libraries and archives are concerned with proving the value of their services and engage in active outreach to increase their visibility and relevance to institutions of higher education. One way to accomplish this is to invest in embedded experiences that provide deep meaning to a small number of students and instructors. Another way, and the one for which this research is relevant, is to increase broad appeal to more stakeholders. Questions of scale are a core component of and a recurring challenge for any instructional program. Making informed use of digitized materials in the classroom is one way to match instructional scale to institutional scale without sacrificing learning or engagement. Once digitized and collected, materials can be reused with less time commitment from librarians and archivists to select, pull, and return them (particularly when the items are stored off-site). Additionally, as more classes are taught in online and hybrid formats, librarians must continue to make strategic decisions about when to use digitized materials versus physical materials. These decisions will, in turn, take on greater significance regarding the value and relevance of primary source collections to institutions. Expanding the use of primary source materials into digital spaces may have implications not only for primary source pedagogy and student learning but also for the long-term preservation and value of the materials to the institutions that support them.

Of course, the limitations of this study elicit additional questions and may spark further areas of research. For example, the study's questions about learning and engagement with digital and physical primary sources, when applied to courses requiring extended use and interpretation of primary source materials, may likely produce data that provide more nuance to the understanding of learning and engagement. Additionally, the research practices of doctoral students and faculty members would bring added perspectives to the question of the strengths and limitations of digital versus physical primary sources. Many researchers use digitized primary sources, but to what extent and in what circumstances? When do experts consider a digital copy an acceptable surrogate for the physical item? What implications does this have for student learning and habits? What implications do these practices have for primary source collections?

This study was driven by the authors' background in and experience with teaching and learning in general, rather than with primary source materials. Because of their background, they endeavored to gather data about the effect of digitized and physical materials on students' learning and engagement—data that they believe highly applicable to primary source instruction. They were interested primarily in providing librarians, archivists, and instructors with relevant data to make informed decisions about effective pedagogy given limitations of time, resources, and scale. While the authors would never argue against the importance of providing students with the experience of engaging with physical primary sources, this study shows that digital surrogates can be equally effective for student learning and engagement in some circumstances.

Making informed use of digitized materials in the classroom is one way to match instructional scale to institutional scale without sacrificing learning or engagement.

Additionally, one unexplored area within primary source pedagogy is teaching students to analyze digital sources as artifacts. Users, as James Mussell asserts, must be able to “analyse how a resource has been put together if they are to understand how the digital representation differs from whatever it republishes.” He suggests this form of analysis may, in turn, allow users to “understand how a specific instantiation of the source material affects what it means. All editorial projects make arguments about whatever they republish, and digital resources are no exception.”¹⁹ Some strategies that support this approach could encourage students to ask rhetorical questions about how users are positioned in the narratives constructed by digital collections, the level of collaboration encouraged by digital collections, and the individual and group identities rhetorically constituted by digital collections.²⁰ Additional approaches might include analyzing the affordances that a digitized primary source provides a user (for example, the ability to zoom in to examine a scanned document); examining the interface design of a collection to infer what argument it makes for the materials in its collection; and studying the software and hardware (for example, markup languages and operating systems) used to instantiate the source itself, as well as what these elements reveal about its digital materiality.²¹

Given the results of this experiment, the authors seek to provide a useful resource for librarians, archivists, and instructors. They also hope to initiate conversations about choosing both the appropriate resources and the most effective format for inspiring student engagement and learning in the twenty-first century.

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Notes

1. See Patrick Garcia, Joseph Lueck and Elizabeth Yakel, “The Pedagogical Promise of Primary Sources: Research Trends, Persistent Gaps, and New Directions,” *Journal of Academic Librarianship* 45, 2 (2019): 95.
2. Ibid.
3. Articles that focus on primary source literacy skills include Joanne Archer, Ann M. Hanton, and Jennie A. Levine, “Investigating Primary Source Literacy,” *Journal of Academic Librarianship* 35, 5 (2009): 410–20; Anne Bahde, “The History Labs: Integrating Primary Source Literacy Skills into a History Survey Course,” *Journal of Archival Organization* 11, 3–4 (2013): 175–204; and Peter Carini, “Information Literacy for Archives and Special Collections: Defining Outcomes,” *portal: Libraries and the Academy* 16, 1 (2016): 191–206. Articles addressing models of primary source literacy include J. Gordon Daines and Cory L. Nimer, “In Search of Primary Source Literacy: Opportunities and Challenges,” *RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage* 16, 1 (2015): 19–34.
4. See Morgan Daniels and Elizabeth Yakel, “Uncovering Impact: The Influence of Archives on Student Learning,” *Journal of Academic Librarianship* 39, 5 (2013): 414–22; Anne Bahde and Heather Smedberg, “Measuring the Magic: Assessment in the Special Collections and Archives Classroom,” *RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage* 13, 2 (2012): 152–74; and Magia G. Krause, “Undergraduates in the Archives: Using an

- Assessment Rubric to Measure Learning," *American Archivist* 73, 2 (2010): 507–34, <https://doi.org/10.17723/aarc.73.2.72176h742v201115>. Daniels and Yakel pose useful questions for evaluating student learning.
5. Magia G. Krause, "It Makes History Alive for Them': The Role of Archivists and Special Collections Librarians in Instructing Undergraduates," *Journal of Academic Librarianship* 36, 5 (2010): 401–11, <https://doi.org/10.1016/j.acalib.2010.06.004>.
 6. For articles about the role of digitized collections in K–12 education, see Anne Gilliland-Swetland, "An Exploration of K–12 User Needs for Digital Primary Source Materials," *American Archivist* 61, 1 (1998): 136–57; Richard Cox, Janet Alcalá, and Leanne Bowler, "Archival Document Packets: A Teaching Module in Advocacy Training Using the Papers of Governor Dick Thornburgh," *American Archivist* 75, 2 (2012): 371–92, <https://doi.org/10.17723/aarc.75.2.04778333025635m0>; Thea Lindquist and Holley Long, "How Can Educational Technology Facilitate Student Engagement with Online Primary Sources? A User Needs Assessment," *Library Hi Tech* 29, 2 (2011): 224–41. Articles addressing the challenges that digitized collections present include Jeffrey W. McClurken, "Archives and Teaching Undergraduates in a Digital Age," in *In A Different Kind of Web: New Connections between Archives and Our Users*, ed. Kate Theimer (Chicago: Society of American Archivists, 2011), 243–54; Stephen Davison, "If We Build It, Will They Come? Strategies for Teaching and Research with Digital Special Collections," *RBM: A Journal of Rare Books, Manuscripts, and Cultural Heritage* 10, 1 (2009): 37–50; and Franky Abbott and Dan Cohen, "Using Large Digital Collections in Education: Meeting the Needs of Teachers and Students," Digital Public Library of America, 2015, <https://pro.dp.la/wp-content/uploads/2018/01/DPLA-Whiting-Using-Large-Collections-in-Education-paper-final.pdf>.
 7. For document packets, see Cox, Alcalá, and Bowler, "Archival Document Packets," as well as Phillip J. Vanfossen and James M. Shiveley, "Using the Internet to Create Primary Source Teaching Packets," *Social Studies* 91, 6 (2000): 244–52, <https://doi.org/10.1080/00377990009602473>. For an extended study of teaching strategies, see Bill Tally and Lauren B. Goldenberg, "Fostering Historical Thinking with Digitized Primary Sources," *Journal of Research on Technology in Education* 38, 1 (2005): 1–21.
 8. See Peter J. Wosh, Janet Bunde, Karen Murphy, and Chelsea Blacker, "University Archives and Educational Partnerships: Three Perspectives," *Archival Issues* 31, 1 (2007): 88–94. See also Alexandra Chassanoff, "Historians and the Use of Primary Source Materials in the Digital Age," *American Archivist* 76, 2 (2013): 470–72. In "Beyond the Physical Archive: Imagining Primary Source Literacies in the Digital Age," Melanie Maksin and Nina Clement outline a series of questions designed to spark students' investigation of the provenance of digitized sources, effectively addressing one of the challenges Chassanoff identifies in her interviews with historians. See Melanie Maksin and Nina Clement, "Beyond the Physical Archive: Imagining Primary Source Literacies in the Digital Age," paper presented at the Association of College and Research Libraries (ACRL) Annual Conference: Imagine, Innovate, Inspire, Indianapolis, Indiana, April 2013.
 9. For an early take on the affordances of digitized collections and their advantages for K–12 history education, see John K. Lee, "Digital History in the History / Social Studies Classroom," *History Teacher* 35, 4 (2002): 510, <https://doi.org/10.2307/1512472>. For a series of rhetorical strategies and properties teachers can use to promote students' archival literacy, see Jessica Enoch and Pamela VanHaitsma, "Archival Literacy: Reading the Rhetoric of Digital Archives in the Undergraduate Classroom," *College Composition and Communication* 67, 2 (2015): 216–42. As Enoch and VanHaitsma note, their purpose in examining multiple digital archives to illustrate their rhetorical components is to underscore the variety of archives: "Each [digital archive] requires users to leverage their archival literacy as a means to understand the archive's particular rhetorical import." (220)
 10. James Mussell asserts that this attitude about digital sources as "less than" is a "false choice based on a false premise. Digital resources should not replace the [physical] material in the archive but instead complement it, providing another way to approach whatever is being



- studied." See James Mussell, "Teaching Nineteenth-Century Periodicals Using Digital Resources: Myths and Methods," *Victorian Periodicals Review* 45, 2 (2012): 204, <https://doi.org/10.1353/vpr.2012.0024>.
11. Our study was approved by Indiana University's Institutional Review Board, and all data collected for this study were done so with students' full and written consent.
 12. The Guidelines for Primary Source Literacy were approved by ACRL in 2018. See David Free, "Guidelines for Primary Source Literacy," *ACRL Insider*, March 15, 2018: <https://www.acrl.ala.org/acrlinsider/archives/15473>. The guidelines are available at <http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/Primary%20Source%20Literacy2018.pdf>.
 13. The rubric for assessing student engagement was based on the work of Susan L. Lutz, John T. Guthrie, and Marcia H. Davis, "Scaffolding for Engagement in Elementary School Reading Instruction," *Journal of Educational Research* 100, 1 (2006): 8.
 14. The rubric is available via the ACRL Framework for Information Literacy Sandbox <https://sandbox.acrl.org/library-collection/primary-source-literacy-rubric>.
 15. Studies in reading academic texts in physical and digital formats have noted similar findings regarding distraction in the digital format. See, for example, David B. Daniel and William Douglas Woody, "E-Textbooks at What Cost? Performance and Use of Electronic v. Print Texts," *Computers & Education* 62 (2013): 18–23, <https://doi.org/10.1016/j.compedu.2012.10.016>. Their study reveals that students' reading times in e-textbooks were higher than in printed textbooks, and this disparity may be explained by the ability to multitask and to become distracted while reading an e-text.
 16. Daniel and Woody, "E-Textbooks at What Cost?" 22. See also Lauren M. Singer Trakhman, Patricia A. Alexander, and Lisa E. Berkowitz, "Effects of Processing Time on Comprehension and Calibration in Print and Digital Mediums," *Journal of Experimental Education* 87, 1 (2019): 101–15. They suggest that given students' increased reading speed and processing time for comprehension when reading e-texts, educators must consider how to slow students' reading rates and better gauge their level of understanding, suggesting that educators insert "guiding questions or reminders to reflect on what has been read online" (113).
 17. See Wosh, Bunde, Murphy, and Blacker, "University Archives and Educational Partnerships," 88 and 92–94.
 18. See Vanfossen and Shiveley, "Using the Internet to Create Primary Source Teaching Packets," 245; see also Lindquist and Long, "How Can Educational Technology Facilitate Student Engagement with Online Primary Sources?" 9.
 19. See Mussell, "Teaching Nineteenth-Century Periodicals Using Digital Resources," 205. Similarly, the rhetorical strategies and properties outlined in Enoch and VanHaitsma's article provide a good model for analyzing digitized archives as primary sources. See Enoch and VanHaitsma, "Archival Literacy."
 20. Enoch and VanHaitsma articulate these and other approaches in more depth. See "Archival Literacy," 224–30.
 21. Scholars in digital humanities have begun to analyze digital collections and digitized sources using these approaches. See Matthew G. Kirschenbaum, *Mechanisms: New Media and the Forensic Imagination* (Boston: MIT Press, 2008), 25–109. See also Meg Meiman, "Digitizing the Nineteenth Century: Scholarly Editing, Interface Design, and Affordances for Public Engagement," PhD diss., University of Delaware, 2015, 33–134, <http://udspace.udel.edu/handle/19716/17209>.