

Analyzing Historical Primary Source Open Educational Resources: A Blended Pedagogical Approach

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This qualitative case study addresses the need for pedagogical approaches to working with open educational resources (OER). Drawing on a mix of historical thinking heuristics and case analysis approaches, a blended pedagogical strategy and primary source database were designed to build student understanding of historical records with transfer of knowledge to related, contemporary problems. Thirty-seven graduate students tested the five-step strategy as they worked with historical OER on the topic of public health among slaves on 19th-century American plantations. Findings demonstrate the pedagogical strategy supported pattern identification and model building among all students and, for most students, the ability to transfer and use their understanding to inform new problems. Students expanded their understanding of 19th-century plantation life and factors impacting public health. Recommended adjustments to the strategy include added support for content curation, collaborative argument building, and discussion.

The increasing availability of open educational resources (OERs) has not been widely matched with appropriate pedagogical approaches or technological solutions for learning with those resources. In this study, a blended pedagogical approach drawing on historical and case-based thinking strategies was tested by students exploring historical primary sources in a structured SQL database. University students tested the pedagogical approach and related database by examining a set of primary sources focused on the topic of public health among slaves on antebellum plantations in the American south. The results of this study can equally benefit teachers in need of pedagogical approaches to better integrate OERs in the classroom and technologists in need of research to inform the design of systems for learning with OERs.

OERs are free online materials made available for general use, sometimes in standardized file formats with metadata that support search identification, retrieval, reuse, and adaptation if appropriately licensed. OERs come in a variety of types, including learning objects, e-texts, video, data sets, online courses, massively open online courses, and primary sources (Bliss, Robinson, Hilton, & Wiley, 2013; Brent, Gibbs, & Gruszczynska, 2012).

Although OERs provide students with an opportunity to learn from previously inaccessible or higher quality digital materials, they often challenge instructors who must change pedagogical practices to incorporate them effectively (Bliss et al., 2013). OER developers need to address not just production, but underlying pedagogy as well (Gurell, Kuo, & Walker, 2010; Hassler, Hennessy, Knight, & Connolly, 2014). When soliciting OER contributions, for example, some curators have included pedagogical fields such as “how to use the resource” and “advice for students” (Brent et al., 2012, p. 11).

This study addresses the need for pedagogical approaches in OERs by testing a blended pedagogical strategy for teaching with one type of OER, in particular: historical primary sources. The OERs used in this study represent a collection of primary sources around a particular theme: public health among slaves on plantations in the American south prior to the U.S. Civil War. Within the field of history, Lee (2010) noted that “digital archival historical collections are often very difficult for students to use and often do not include pedagogical structures that might otherwise aid information retrieval” (p. 83). The blended strategy employed in this study is based on a combination of recommended heuristics for historical analysis of primary sources, as well as recommended pedagogical approaches for learning with indexed, case-based materials.

Historical and Case-Based Thinking

In this section, literature and theory for historical and case-based thinking are described and integrated to propose a blended pedagogical approach for examining OER. Historical thinking refers to strategies students can undertake to inquire into primary sources, such as summarizing, contextualizing, and corroborating (Hicks, Doolittle, & Ewing, 2004). In addition, two case-based thinking approaches are integrated into the blended pedagogical approach, as they provided guidance on how to work with collections of cases or primary sources: cognitive flexibility theory and case-based reasoning.

Cognitive flexibility theory (CFT) suggests that learners can be better prepared for solving ill-structured, complex problems if they are trained to extract common elements between the schemata of variant cases, acquiring flexible and adaptive knowledge capable of transfer (Spiro & Jehng, 1990). Instead of oversimplifying instructional materials, learning environments based on CFT would present natural cases in cross-linked databases to provide learners with the means to traverse cases and identify themes (Feltovich, Spiro, & Coulson, 1989). Early CFT databases included case material indexed and linked by experts, but contemporary content development approaches involving vetted crowd-sourcing (e.g., Wikipedia, Scoop.it) may generate useful material for problem solving as well.

Case-based reasoning environments are, likewise, structured with libraries or stores of cases that students draw on to adapt or suggest solutions for new problems. Case-based reasoning environments often contain a variety of scaffolds to help learners adapt case materials, including indices, prompts to help with noticing critical issues, and collaboration capabilities to put adapted solutions to the test of peers’ experiences and understandings (Jonassen & Hernandez-Serrano, 2002; Kim & Hannafin, 2008; Owsenby & Kolodner, 2002; Wang, Moore, Wedman, & Shyu, 2003). Drawing on these historical and case-based

thinking strategies, we propose a five-step, sequential pedagogical approach for working with OER. The five steps students followed to analyze primary sources in this study are elaborated in the Procedures section.

Step 1: Chronological Reading–Summarizing

Primary source analysis often begins by summarizing the information in a document, the author, the topic, and the purpose (Fillpot et al., 2010; Morgan & Rasinski, 2012; Tally & Goldenberg, 2005). A summarizing step allows students to take inventory of the information in a database. Students can also indicate things they noticed about a document, as well as anything unexpected or puzzling to be further investigated (Carini, 2009).

Step 2: Contextualizing and Corroborating

In historical analysis, contextualizing involves students noting when and where a document was created, as well as the temporal and geographic context from which they may make inferences about the document (Hicks et al., 2004; Lee, 2010; Morgan & Rasinski, 2012). Many also advocate for a corroborating phase, in which students compare one source to another to identify any trends or commonalities (Doolittle & Hicks, 2003; Stanford History Education Group, 2016; Wineburg, Martin, & Monte-Sano, 2012).

Contextualizing and corroborating phases align well with CFT, which deals with the ways individuals acquire understanding across a set of cases. Case databases structured according to principles of CFT allow learners to traverse cases, identify similar and divergent themes, and assemble flexible knowledge (Spiro & Jehng, 1990). By traversing cases from different search angles, research suggests that students can develop connected knowledge structures that are transferable to novel situations (Jacobson & Spiro, 1995).

Relative to historical analysis processes, traversing could be supportive of contextualization if “the context of a time and place” in a target document is clarified by visiting other related documents with similar themes (Fillpot, 2010). For example, a mention of clothing in a target document about American plantations might be contextualized in another when students discover that premanufactured clothing was not provided in the 1840s. Instead, raw materials (e.g., wool and buttons) were provisioned for slaves, presumably to make their own garments. Traversing is likely to be supportive of within-database corroboration as well, as students identify trends across letters (e.g., references to sick slaves across multiple letters).

A number of studies from both historical and case-based analysis literature have suggested that scaffolds, such as synthesis questions, may help students (a) attend to critical issues and (b) manage the heavy cognitive load imposed when traversing multiple primary sources and applying unfamiliar heuristics, such as corroboration (Liu, Bera, Corliss, Svinicki, & Beth, 2004; Niederhauser, Reynolds, Salmen, & Skolmoski, 2000; Owings-Swan & Hofer, 2008).

Step 3: Drawing from Perceptual Overlays and Making Claims

In historical analysis, students may be asked to draw conclusions or significance from their study, relating documents back to inquiry questions or constructing historical claims or hypotheses with the support of gathered evidence (Cleary & Neumann, 2009; Stanford History Education Group, 2016). To assist students with making informed claims, the concept of a perceptual overlay from CFT can be applied to encourage students to look at

primary sources through a different lens (e.g., a related case, article, or position paper), and to deliver “the message that what they first see is not all they can and should see” (Spiro, Collins, & Ramchandran, 2007, p. 22).

Similar to an “opening up the textbook,” or OUT, approach students can look outside of a particular primary source database at secondary sources that might conflict with or elaborate on the primary source texts (Stanford History Education Group, 2016; Wineburg et al., 2012). A common complaint regarding OER is that “context and wrap around activities are missing” (Hatzipanagos & Gregson, 2015, p. 100). This step can address both limitations by adding the context of perceptual overlays and fostering guided extraction, comparison, and application of information from both primary and secondary sources to make informed claims.

Step 4: Transfer and Transformation—Writing an Informed Action Plan

Students working in cognitive flexibility learning environments are often given a new problem to test the transferability of their understanding. The case-based reasoning process is one approach to transfer where a new problem is presented, prior case material from experience or a repository is retrieved, and that material is reused or adapted to suggest solutions or interpretations for the new problem (Jonassen & Hernandez-Serrano, 2002; Kim & Hannafin, 2008). Justified solutions may be considered a type of transformation recommended in historical analysis literature. A goal of learning with primary sources is moving beyond simply retelling that information to transforming it; transformation can take place through argumentative writing, drawing on elements of texts to build an argument (Wiley & Voss, 1996).

Step 5: Reflecting With Others

OERs “can be didactic in nature,” as interaction is infrequent or poorly structured (Hatzipanagos & Gregson, 2015, p. 100). Discussing primary sources with others can help to reveal multiple interpretations of history (Cleary & Neumann, 2009; Doolittle & Hicks, 2003; Stanford History Education Group, 2016), and when new solutions are proposed from cases, can put adapted solutions to the test of peers’ experiences and understandings (Owensby & Kolodner, 2002). Students might share micro-essays about primary sources to initiate discussion with peers (Westerman, 2014), engage in “structured academic controversies” by taking divergent historical positions to reveal differences and work toward consensus (Stanford History Education Group, 2016; Wineburg et al., 2012), or construct arguments for a particular action on a new case that are rebutted by peers (Tawfik & Jonassen, 2013).

Methods

Research Design

This study employed an instrumental qualitative case study design with in-depth study of a bounded system—a group of graduate students conducting research on a specified set of primary sources with the aid of pedagogical prompts and an SQL database (Creswell & Poth, 2017). The primary unit of analysis was individual student users of the primary source database.

Research Questions

Five research questions directly addressed the five steps of the tested pedagogical approach to determine if the approach led to expected learning outcomes:

1. How effectively do students identify trends or patterns across primary sources, and what do they identify (Steps 1–2)?
2. Are students beginning to develop personal models to explain a complex domain (Steps 1–2)?
3. What roles do perceptual overlays play in helping students infer conclusions about the primary sources (applying present to inform the past; Step 3)?
4. How effectively do students flexibly transfer and apply case information to resolve a new scenario (applying past to inform the present; Step 4)?
5. What role does discussion play in helping students refine personal models of a complex domain (Step 5)?

Participants

This study was conducted in a graduate-level course on advanced multimedia systems, as it provided students in that course with opportunities to (a) learn about a recommended pedagogical strategy for parsing OER and (b) experiment with a related SQL database that supported steps in that strategy. Ideally, students taking the course would learn to apply the pedagogical approach in their own teaching or design similar systems to facilitate student learning with OER.

This course is taken by students in a Learning, Design, and Technology graduate program at a southern U.S. university. In all, 37 graduate students tested the pedagogical strategy and communicated their research results with one another. This sample included 27 females and 10 males, and 15 of 37 students were active in-service teachers.

Materials

The first author researched undigitized primary sources in the Southern Historical Collection's Cameron Family Papers to identify resources that would depict slave life. The papers in this collection are mostly handwritten correspondence or letters between individual authors. More than 100 letters that referenced slaves and slavery from four antebellum plantations were digitally photographed, tagged for themes, transcribed, uploaded into an online SQL database, and presented in an Adobe Flash-based search interface (Figure 1). While primary sources from outside the Cameron Family Papers may have provided additional context, for simplicity only primary source letters from this one collection were included in the database.

The letters in this database were sourced with documented metadata (i.e., author, place, date, themes, and summaries), representing a scaffold that historians would not normally have when working in unsorted collections. Also noteworthy are the Boolean search capabilities (and/or) to retrieve letters coded with specific themes, the ability to view two letters side-by-side in support of corroboration, the ability to view a letter in its original or transcribed format, and the provision of keyword themes and summaries for each letter retrieved in a search.

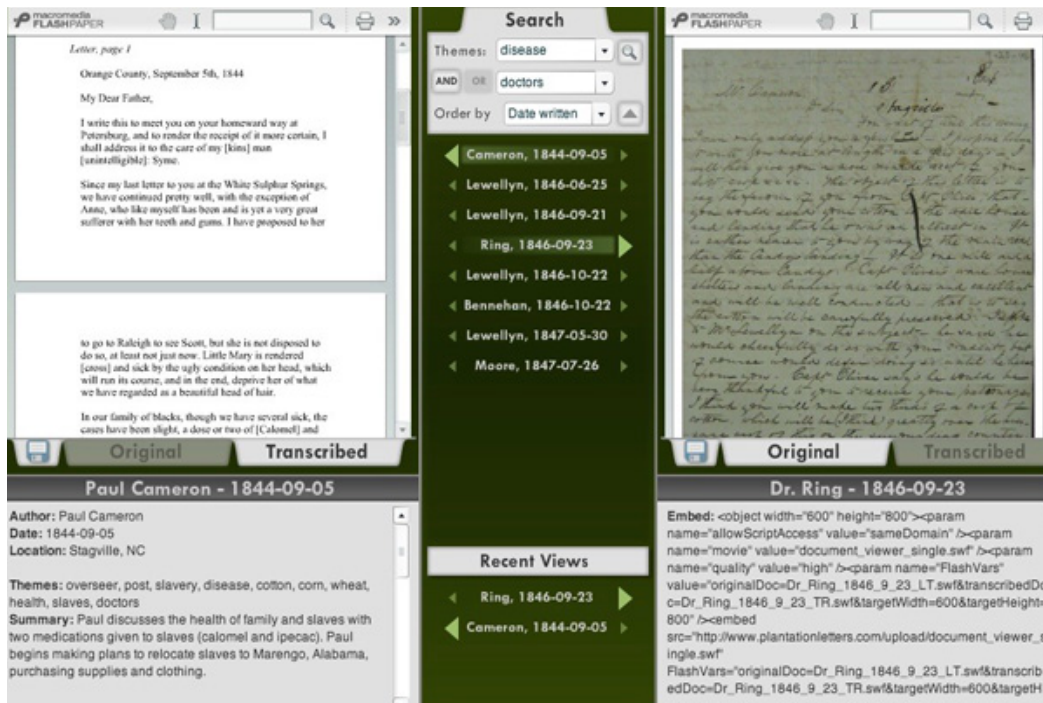


Figure 1. Adobe Flash search interface for the SQL database.

To support the recommended OER characteristic that resources be meaningfully editable, the database allows users to both download letters and copy embed code so that letters can be reused in other settings, perhaps as part of reflective activities (e.g., embedded on a blog with reflection; Brent et al., 2012). The database is publicly accessible at <http://plantationletters.com/letters.html>

In the process of tagging resources, we noted that public health themes were evident in 33 of the 107 letters (e.g., slave housing conditions, food, clothing, medicine). While other themes were evident (e.g., agriculture, politics), we decided that public health would be a good topic for students to research, because the large number of poor public health cases in these letters (e.g., disease and death) would allow students to explore potentially interrelated factors (e.g., weather and workload). Per the design of learning environments reflective of CFT and case-based reasoning, it was important to select a topic that would allow students to traverse a database with interrelated topics to identify patterns and generate theories for what they were seeing. [Appendix A](#) illustrates cross-listed themes in the 33 letters examined by students in this study.

Procedure

Participants worked through the five steps of the pedagogical strategy to analyze a set of 33 primary source letters and to transfer their understanding to inform related public health problems. Each step required approximately 3-4 hours, depending on the speed and thoroughness of individual participants. Students worked individually on Steps 1–4 and collaboratively on Step 5.

Step 1. In Step 1, students were provided with a list of letters to read through chronologically that were pretagged with 11 themes tied to living conditions for slaves on American plantations: childbirth, infant mortality, health, death, disease, doctors, clothes, food, housing, workload, and weather. Students were asked to read the entire set of letters in one sitting and to record facts, figures, and initial thoughts as typed notes on a worksheet that they submitted for credit. [Appendix A](#) contains a copy of the worksheet with scaffolds and prompts that students followed across the five steps of the pedagogical strategy.

Step 2. In Step 2, students were asked to traverse and reread the 33 letters by Boolean searching for any theme combinations of interest that could help to identify trends across the letters (e.g., disease AND doctors, health AND workload). Students were notified that they would be reading individual letters more than once, but in the context of different searches that could reveal new insights, connections, and trends. To ensure students identified key lessons from the database, they were asked to answer four knowledge synthesis questions suggestive of theme combinations for Boolean searching:

1. What was the general health of slaves on the described plantations?
2. How were slaves treated when ill?
3. Do you think slaves were provided with the basic necessities to maintain good health?
4. Do you think the slaves' workload could have contributed to poor health?

Step 3. In Step 3, students were presented with a perceptual overlay or three short articles describing public health crises in Africa, Haiti, and America. On their worksheet in a two-column table, students recorded conditions that experts described as leading to modern public health crises in one column (e.g., lack of sanitary drinking water), juxtaposed against similar conditions they had read about on American plantations in an adjacent column. This step's goal was to help students see similar conditions at play in both modern and plantation settings that might lead to making inferences regarding what caused the many cases of sick and dying slaves as detailed in many of the letters.

As recommended in historical analysis literature, students completed this step by writing a short 250 to 350-word historical claim as to whether or not they believed slaves were facing a public health crisis, citing at least four factors to support their claim. The intended directionality in this activity was drawing on modern cases to help understand and make inferences about the past.

Step 4. In Step 4, students were asked to transfer their new understanding of public health to prepare an informed action plan for a new scenario: the aftermath of a destructive earthquake and tsunami in Japan. Students were asked to reference primary and secondary sources to justify four public health priorities that would best serve the impacted population. The intended directionality in this activity was drawing on past cases to inform the present, consistent with the recommendation of Endacott (2005) to "take examples from past societies and use them as evidence for solving contemporary problems" (p. 228).

Step 5. In Step 5, students shared claims from Step 3 and action plans from Step 4 on two separate discussion forums, while commenting on at least three other claims and three other plans. This strategy aimed to help learners expand their understanding and refine their personal models of the knowledge domain using corroborating and divergent peer frames.

Data Sources and Analysis

Each step of the procedure generated a written artifact for analysis. In Steps 1–4, students collected their writing on a digital worksheet into which they typed their responses and subsequently emailed to the instructor as an attachment ([Appendix A](#)).

Student writings in Step 5 were collected in an online discussion forum and extracted to text documents. With the exception of notes and question responses (Steps 1–2), artifacts were related to separate research questions and, consequently, were analyzed separately. Table 1 provides a summary of data collected and analysis methods for each step of the procedure.

Table 1
Data Sources and Analysis Methods

Step	Data Sources	Analysis Methods
1-2	notes and question responses	These data were imported into ATLAS.ti qualitative analysis software, open coded, then sorted into like categories: what public health patterns students found in the data, unanswered questions students were asking about the data, tentative explanations or assumptions students were making as they attempted to understand the data, challenges the data presented to students' personal beliefs, and attempts by students to merge their own experiences with the data. As many of the student text segments contained a code for "illness/death," the co-occurrence explorer in ATLAS.ti was used to search for codes co-occurring with this predominant code as evidence students were beginning to identify patterns in the data. Co-occurrences were subsequently sorted into further categories to describe the types of patterns students were finding (i.e., contributing, response, and contradictory).
3	tables comparing health conditions in overlay cases and plantation cases, claims about slaves facing a public health crisis	Student tables juxtaposing conditions in overlay cases with plantation cases were examined with frequency counts tabulated to illustrate common conditions students found between the two case sets. Student claims were examined to determine how many students used overlay case information to justify a position on slaves facing a public health crisis.
4	informed priority plan for transfer case	Student priority plans were examined with frequency counts tabulated to illustrate the types of priorities being recommended for the transfer case, and the number of students referencing overlay and plantation cases to justify their priority plans were noted.
5	discussion transcripts	Forum transcripts were imported into ATLAS.ti qualitative analysis software, open-coded, then sorted into like categories and three themes to describe how discussion helped students refine their personal models of this domain: by introducing difference, clarifying, and applying new lenses.

Findings

Research Question 1 (Steps 1–2)

Thirty-five students used phrases in their notes like “in many letters,” “in nearly every letter,” and “in a majority of letters,” to indicate they were finding patterns across multiple letters. Students noted a pattern of illness, death, and disease mentioned in most letters:

In a single letter during August of 1845, Lewellyn reported that at least eleven slaves were sick on the plantation in Greene County, Alabama. Peter and William died. During September and October of 1846, conditions were perhaps worse with between ten and twenty slaves constantly sick. Sandy, Limon, and Sandy’s child died. In late October, Bennehan reported that half of the slaves were sick on the plantation in Stagville, North Carolina. ... A year later, Lewellyn reported that between fifteen and forty slaves were sick for a span of weeks. Three children died, including the cook’s child.

Students noted a pattern across letters of doctors being called to treat sick slaves with medicines administered in some cases:

When the slaves became seriously ill, they usually received medical care. Lewellyn was the main caregiver, but he occasionally sought assistance from doctors. In 1845 Cameron mentioned that slaves responded well to the medicines calomel and ipepac. In September of 1846, Dr. Ring treated Simon, but he died from a “chill” nevertheless. ... During the summer of 1847, Dr. Moore treated Caroline and Fanny. He concluded that Caroline would not recover because she had syphilis. In May of 1847, Lewellyn failed to send for a doctor, and Diley’s child died.

Students noted a pattern in some letters of owners voicing concern over slave health:

The concern for slave health is ... mentioned in nearly every letter between father and son. The way in which each slave is treated during illness differs between cases. It seems as though the women were treated by doctors more often and given a bit more attention, at least according to the letters. Some sick and injured slaves were allowed to rest for long periods of time in order to recover. The slave with the hurt foot is said to have been allowed to rest for several weeks or perhaps months. The letters also speak of finding the best doctors and avoiding doctors with bad reputations.

Students noted a pattern in many letters of slaves given poor quality clothing, housing, and food:

The slaves were provided with a diet primarily consisting of pickled pork. At times there was a plentiful crop of turnips as well.... Two additional letters noted the shipments of additional pork, but there was accompanying concern that there would not be enough to feed all on the plantation. Another letter voiced concern about a smaller than expected shipment of salt. Used as a food preservative, salt was essential in preparing food to last through the winter months.

Students noted a pattern in some letters of heavy slave workload:

One letter mentioned that 50 slaves picked almost 7200 pounds of cotton in one day, another listed information about the picking productivity of individual slaves. There are also a couple of allusions to slaves not being as productive as they could be. ... Some overseers mention working for up to two weeks, every day, to get a crop planted or harvested.

Across all 37 student question responses, 164 text segments were coded with “illness/death.” The co-occurrence explorer in the ATLAS.ti software was employed to identify segments of text that included this predominant code “illness/death” and at least one other code, as these co-occurrences might provide evidence that students were able to identify elements related to illness/death across the letters. Indeed, students identified contributing factors and responses to illness/death and contradictory details around illness/death (Table 2).

Steps 1 and 2 of the pedagogical strategy with students summarizing letter content, then traversing letters to corroborate tentative findings and answer synthesis questions, were effective in helping students identify public health patterns in the letters.

Research Question 2 (Steps 1–2)

First, data suggested that students were able to identify limits in their own personal models that could lead to further inquiry or questioning. Students frequently posed questions in notes and question responses about such items as slaves' workload ($n = 8$), food ($n = 7$), housing conditions ($n = 6$), medicine ($n = 6$), and sanitation ($n = 5$):

- “The letters were not really specific on how long the workdays were and how much work was done. Also, it is not evident how hard the work was.”
- “Their houses.... I'm still not totally clear on as to how well they were built, the size, the number of rooms, sanitation (food preparation, waste management) — so I don't feel that I can speak to that aspect.”

Second, as evidence that students were beginning to develop personal models, all 37 students offered explanations or assumptions for what they were reading that, again, could lead to further inquiry to support a claim. Sample student assumptions included (a) food may have lacked nutritious qualities as evidenced by teeth, gum, and hair loss described in letters, (b) water may have been contaminated from waste and runoff, and (c) overcrowding in housing might have contributed to the spread of disease:

- “Their diets probably added to the sickness since they were not getting the nutrients they needed to stay healthy.”
- “Water may have been collected from the same place as was used to wash clothes, bathe, and use as a bathroom facility. ... much disease can come from this.”
- “Although it was not mentioned in any of the letters, the construction of clothing and shoes was most likely also done by the slaves.”

Third, data suggested that some students integrated prior experiences with the readings in an attempt to understand and explain the slaves' poor health. For example, four students noted from prior experience and field trips to farms that picking cotton is hard work that can lead to back and joint strain plus lacerations. Three students noted from personal experience that working long days with little sleep can damage one's immune system, working outside in the cold can lead to sore throat and fever, and eating a diet of fatty pork can lead to heart disease:

Table 2
Co-Occurrences With Predominant Code Illness/Death

Contributing Factors Identified	Responses Identified	Contradictory Details Identified
<ul style="list-style-type: none"> • weather and patterns of sick slaves during cold/rainy periods (<i>n</i> = 8) • workload and patterns of slaves working while sick or shortly thereafter with heavy productivity: 140-200 pounds of cotton picked per day, per person (<i>n</i> = 23) • housing and patterns of sick slaves confined in cabins of suspect quality with possible contamination (<i>n</i> = 11) • age and patterns of the youngest and oldest slaves being sick more often, for longer periods of time, and with higher morbidity (<i>n</i> = 8) • diet and patterns of slaves eating little variety beyond pickled pork with minimal vegetables and possible malnutrition (<i>n</i> = 7) 	<ul style="list-style-type: none"> • Doctors called for seriously ill slaves (<i>n</i> = 19), but not in all cases and not always successful, with patients dying (<i>n</i> = 9) • medicine administered to the sick (<i>n</i> = 13) but utilizing medicine of questionable value (e.g., ipecac) (<i>n</i> = 3) • owners providing slaves with bed rest, medicine, and doctors (<i>n</i> = 9), but students questioning whether this represented compassion or concern over human investments and plantation profits (<i>n</i> = 4) 	<ul style="list-style-type: none"> • Doctors being called for whites more frequently than for slaves (<i>n</i> = 3), with a faster recovery period for whites (<i>n</i> = 2) • slaves being described as “improving” in one letter and then sick again or dead in another (<i>n</i> = 1) • children described as “fat as pigs” while adults were described as “feeble and pale” (<i>n</i> = 2) • sick owners encouraged to “pamper” themselves while slaves were sent back to work while sick (<i>n</i> = 1) • owners detailing the health of relatives in letters while mentioning slave health only in passing (<i>n</i> = 2)
<p>“It appears, from the letters, that the plantation slaves did not have adequate clothing either. Despite working in the fields daily ... Mr. Lewellyn and Mr. Cameron only made reference to two types of clothing—summer and winter. ... At one point, Mr. Cameron does mention the need to replace some of the women’s clothing—but only after he has noticed its condition was ‘most miserable’ and ‘easily penetrated by the rain.’”</p>	<p>“In each letter that Lewellyn mentions a sick party, he also mentions that he called for the doctor and was able to give medicine and care to those that were sick until the doctor’s arrival. He apologizes in his letters when the doctor is not able to be reached in time as though he does not want to be punished for not giving the best care to the slaves.”</p>	<p>“I felt as if more detail and sympathy was given in the discussion of the plantation owner’s and overseer’s families and friends. I remember quite a few letters lamented about missing wife/sisters, the health and well-being of different kin, listing the general health of other local ‘whites.’ However, as if by a fleeting thought, within some of the letters, the overseer would quickly mention a ‘hand’ dead or sick.”</p>

- “I have had a conversation with a cotton farmer before, and from what I can gather, picking cotton even for a short time is very physically demanding.”
- “I cannot imagine how unhealthy pickled pork would have been for the slaves. Excessive amounts of pork are a contributor to heart disease, and the monstrous amount of sodium to preserve the pork was also unhealthy.”

Fourth, data suggested that student inquiries resulted in challenges to personal beliefs that could help to further refine personal models. For example, students noted they were surprised to discover that (a) slaves were provided with medical care ($n = 5$) and with provisions like wool, buttons, and leather for clothing, (b) the number of sick and dying was relatively low given the conditions ($n = 4$), (c) the owners and overseers showed some concern for sick slaves ($n = 3$), and (d) bed rest was acceptable when slaves were sick ($n = 2$):

- “...doctors were called in to treat the slaves. I find that this is interesting, since prior to reading these letters, I assumed that they were neglected as far as medical care is concerned.”
- “Considering the harsh conditions under which slaves had to live, I was surprised that the slaves’ health was as good as it was.”
- “Slaves seem to be treated better than expected when ill. The owner seems to show a little concern when slaves take sick.”

The chronological and traverse reading steps revealed that students did not yet fully understand the domain they were studying, as they asked plenty of questions about it and noted assumptions they were making in attempting to understand it. Students’ prior experiences and understandings played a role in helping them make interpretations, but sometimes failed them in the face of unexpected ideas that had to be reconciled with their previously held beliefs.

Research Question 3 (Applying Present to Inform the Past; Step 3)

Students were asked to compare the plantation cases with articles detailing modern-day public health crises (i.e., African refugees, Haiti post-earthquake, and Hurricane Katrina). Data suggested that students were able to identify a number of common conditions in both the modern-day and plantation cases: infectious diseases ($n = 26$); infection in the absence of treatment ($n = 18$); a need for medical interventions — doctors ($n = 28$), supplies ($n = 17$), medicines ($n = 14$), and health education ($n = 13$); and a need for resources — nourishment to promote immunity ($n = 31$), safe water ($n = 31$), sanitation ($n = 23$), and uncrowded housing ($n = 19$).

When asked to make a claim as to whether slaves were facing a public health crisis, nearly every student concluded they were, with six students qualifying their “yes” with “by today’s standards.” In claims, 13 students (35%) used modern case information to help explain what they had seen in the plantation letters:

The article on Hurricane Katrina mentions that a shelter was shut down after 20 residents came down with dysentery-like symptoms. The slaves in the plantation letters experienced some of the same illnesses and it seemed that many of them were ill at the same time. Perhaps this is because they were housed so close together.

In all of the articles, they stated that a major worry was that there was no clean drinking water and discussed some of the short-term effects, such as diarrheal diseases and even

typhoid fever and cholera. These types of effects explain a lot of the symptoms that I read about in many of the letters.

Despite students juxtaposing similar public health issues in modern-day disaster cases and the plantation cases in a two-column table, only about a third explicitly referred to modern-day evidence to make inferential claims about the past. More commonly, students merely summarized direct evidence from the plantation letters to support their claim that slaves were facing a public health crisis.

This finding might suggest that students found it challenging to reason with external evidence removed from the time period (modern-day instead of 19th century) and topic of interest (disasters instead of plantation life), or perhaps students found the overwhelming evidence in the plantation letters to be sufficient to support their claim (i.e., the external evidence was unnecessary to complete the task).

Research Question 4 (Applying Past to Inform the Present; Step 4)

To determine student ability to transfer gained knowledge of public health issues, they were asked to prepare a four-priority plan to address a sample public health crisis in Japan following the 2011 earthquake and tsunami. Students noted 19 different elements they would prioritize in transfer plans, including resources — clean water ($n = 35$), nutritious food ($n = 30$), shelter ($n = 21$) with sanitation ($n = 9$); and medical interventions — doctors ($n = 29$), medical supplies ($n = 12$), and medicines ($n = 6$).

Six students (16%) failed to justify priority plans with references to any plantation or overlay cases. Twenty students (54%) cited plantation cases to justify plans, while 29 students (78%) cited overlay cases to justify plans:

In **Haiti** and **Africa** as well as the Southern **Plantations** [emphasis added], people were malnourished from lack of proper nutrients. This led to a variety of illnesses and eventually death. In all of the places affected, we saw contaminated water.

As with the earthquake in **Haiti**, and the slave **plantations** [emphasis added], lack of doctors, medical care and medicines exasperate [sic] the health crisis.... There was little mention of doctors, or the medical treatment given in the Plantation letters.

It was noteworthy that 11 students (30%) used only overlay cases to justify priority plans, with no mention of plantation cases. Almost all students demonstrated the ability to justify a priority plan for a public health crisis by drawing on case material. Students more commonly relied on similarly modern case material and similar disaster cases to justify their plans, again, providing some evidence that it may be easier to reason with case material that is temporally and topically similar to the target case to be resolved.

Research Question 5 (Step 5)

Students were asked to share crisis claims and transfer plans in separate discussion forums and comment on at least three claims and three plans. Data analysis revealed discussion helped students refine their personal models in three ways: by introducing different perspectives, clarifying, and applying new lenses.

Introducing Different Perspectives. The first way that discussion helped students refine their personal models was by introducing new and different ideas and opinions they had not considered alone. Twenty-two students (60%) noted that peer ideas helped them identify 11 different links to ill-health they had not considered: "I clearly remember reading Lewellyn's comment about the mosquitoes and yet did not hone in on the link between that comment and malaria!"

Peer ideas also helped students consider alternatives for transfer plans they had not considered (e.g., the need for a communication infrastructure, mental health, and transportation):

- "I don't know why but I never considered the fact that electricity is no longer available to these areas. That was a good point to make because it only makes it even harder to give good medical help."
- "... Distribution points for supplies ... overcrowding makes it very difficult for supplies to reach the victims. I missed this point in my reflection."

Students also refined personal models by expressing and considering differences of opinion:

- "I don't think I would call it hopelessness as a cause of their deaths, as it seemed more like apathy. I think that it was just a protection of an investment and the property owners only wanted to pay so much for medical attention before it became too expensive and they could just then purchase a healthy slave."
- "Electricity is a nice necessity but I feel that it isn't priority. I would go with temporary shelter."
- "I disagree about the electricity. Electricity wouldn't be the first priority, but it is very important. Some medical equipment is run by electricity."

Clarifying. The second way that discussion helped students refine their personal models was through clarification. Students expanded on one another's ideas with further information:

- "I also agree that access to medical resources has to be first. The challenge that the slaves had on the plantations was there were few medicines developed. Cholera was only discovered in the mid 1850's. The blood parasite that caused the malaria illness and the typhoid fever illness was only discovered in the 1880's."
- "When you mention temporary housing, I would suggest that the victims are issued tents. ...Tents are fast to build and easy to move."

Students also had questions answered by peers and confusing terms (e.g., dropsy) defined by peers during discussion:

Student A: I wonder what ethical guidelines have been suggested by doctors and philosophers for dealing with large-scale disasters. Choosing who receives care and who does not...

Response: I tried doing some research on this and there is very little information on the net. I was able to find on wikipedia that there are different triage types for classifying the survivors.

Applying New Lenses. The third way that discussion helped students refine their personal models was through the application of new lenses. Some students applied personal lenses to the data, such as comparing plantation conditions to Nazi work camps they had visited in Germany, Chinese public health conditions experienced during the SARS outbreak, parental experiences with poverty and poor housing, and personal life experiences:

After the tornado in [name of town] yesterday, traffic lights were down and trees were blocking roads. That would make reaching a medical facility difficult. ... Back in the 1840s, the horse and walking were the main modes of transportation. ... By the time a doctor reached the patient, it could be too late.

Some students also applied external lenses to the data (e.g., National Public Radio stories on clean water and poverty, public health statistics, articles about disaster response, information on slave care from popular novels, and photographs depicting slave housing):

One of my all-time favorite [television] shows is West Wing. ... A philanthropist says, "I'll give you 10 million dollars to go and solve any world problem." ... She goes on to talk about how reliable roads and transportation for goods and services are critical for solving many of the health and economic problems in sub-Saharan Africa.

Thanks for pulling in these UN sources. They made me think about why "social entrepreneurship" is an important area of development — that is, trying to solve the problem of how we can create social and economic systems that will allow sustainable implementation of what we already know to be true of human health.

The final discussion step helped students to refine their personal models of public health on plantations by introducing new and different ideas and opinions, allowing peers to build on and answer one another's ideas and questions and providing students a chance to integrate personal experiences and external ideas to help explain information in the letters.

Discussion

Identifying Patterns

Through linear and associational searches in the project database, students were able to identify patterns across the letters. Students noted a pattern of illness and death across many letters and began to tease out contributing factors, patterns of response, and contradictions in who got sick, who got treated, and how treatment was viewed. As reported by others (Demetriadis & Pombortsis 1999; Demetriadis, Papadopoulos, Stamelos, & Fischer, 2008; Jacobson & Archodidou 2000), question prompts employed in Step 2 did elicit student thinking and pattern development around general health, treatment, living conditions, and working conditions.

While these findings were positive, literature suggests that an additional curating step, where students go beyond reading cases to contributing new cases, might be useful as part of the blended pedagogical strategy. Schmidt (2007) studied such a database that allowed students to, not only search existing cases, but also add new cases that they found to be relevant and found that students who did so were better able to answer complex questions. Further, some in the OER field have called for greater use of content curation sites such as Scoop.it and Pinterest to improve the discoverability of marginalized open resources (Perryman & Coughlan, 2014).

To the extent that OER can be linked or reposted, extracting and curating a number of resources on a given topic (e.g., slave workload) could assist with historical thinking phases—such as contextualization and corroboration—as secondary sources are integrated into a new hybrid collection with the curator justifying their inclusion. Because students in this study referenced both personal and external cases in notes and discussion (e.g., National Public Radio and the United Nations), a more explicit curating step seems useful.

Developing Personal Models of a Complex Domain

Participants in this study began to develop and refine personal models about 19th-century public health. In notes and question responses, they asked questions about the data and stated assumptions, revealing gaps in understanding. This activity was positive, as historians analyzing primary sources need to be self-aware of limitations in knowledge (Anderson, Day, Michie, & Rollason, 2006). Participants noted findings that challenged prior beliefs, indicating some clarification of misconceptions. They also attempted to explain what they were reading and applied prior experiences and frames to help with interpretation.

Discussion also assisted students with interpretation, resulting in 60% of students identifying links to ill health they had not considered during individual work and helping students consider alternatives to action plans. Students refined models by expressing differences of opinion, expanding on one another's ideas, and answering peers' questions. Prior case-based learning research has shown peer interactions can support the refinement and expansion of personal models, using peers' schemata as "adjunct support" to manage complexity (Spiro, Coulson, Feltovich, & Anderson, 1988, p. 10).

Given the demonstrated usefulness of discussion, one adjustment to the strategy could involve adding a discussion element to each of the first four steps of the pedagogical strategy. During Steps 1–2, an approach similar to that suggested by Carini (2009) could be useful: asking students to analyze assigned documents, perhaps scaffolded by common questions, and then share results with peer groups. As students create narratives across different documents, they learn "how to create continuity out of the disparate pieces of information" (p. 46). Similarly, during Step 3, each student could be assigned a perceptual overlay to study, with students meeting in groups to summarize overlay cases and discuss connections to target material.

Another potential adjustment to the strategy includes adding expert perspectives to help students with interpretations: actual historians participating in discussions (Cleary & Neumann, 2009), or prewritten "thematic commentaries" that point out connections between specific cases and abstract themes (Jacobson & Spiro, 1995, p. 308).

Reasoning With Evidence to Make Claims and Pose Problem Solutions

Students in Steps 3-4 were modestly successful reasoning with case examples to justify claims and to propose action plans for a transfer problem. In Step 3, all students were able to identify common public health conditions between overlay and plantation cases, but only a third used modern overlay cases to support their claim that slaves were facing a public health crisis (applying present to inform the past).

In Step 4, over half of students used plantation cases to justify priority plans (applying past to inform the present), while over three quarters used overlay cases to justify priority plans (applying present to inform the present). About a third of students used only overlay cases to justify priority plans with no reference to plantation cases.

The higher number of perceptual overlay (present case) citations to justify plans was possibly related to easier transference (present case to present case and disaster case to disaster case). While there was value in using overlay cases as another lens to interpret plantation cases, creating a transfer problem that was closer in temporal proximity or topic to the 19th-century plantation cases might have encouraged more justification based on the indexed primary sources.

While Steps 3–4 of the strategy are useful, a few system improvements might result in more students demonstrating the ability to reason with both past and present resources. The database interface in this study did not allow students to save, store, or share identified links across cases, nor construct paths between documents to illustrate arguments. Strobel, Jonassen, and Ionas (2008) found that exploring and traversing hypertext were insufficient steps for learning, and subsequently added features for students to collaboratively construct links. Students' thinking was bolstered by requiring them to (a) represent ideas as nodes and links and (b) describe and name the constructs they added to the environment.

Even if a database does not support argument building, many online tools could, including IHMC's CmapTools for collaboratively concept mapping a domain with links to evidence or emerging network analysis tools like NodeXL for illustrating relevant actor relationships in cases (e.g., overseer's interactions with owner, doctor, and slaves). Because new case relationships were revealed to students in discussion forums (Step 5), having access to others' linkages and arguments earlier in the strategy seems potentially valuable.

Conclusion

Findings demonstrate the blended pedagogical strategy in this study led most students to identify patterns in primary source OERs, begin to refine personal models of a complex domain, and apply primary and secondary source evidence to reason for claims and solutions to a transfer problem. Recommended adjustments to the strategy include (a) support beyond reading to curate primary and secondary sources for greater source contextualization and corroboration, (b) enhanced discussion throughout the strategy, including incorporation of expert perspectives to reveal additional interpretations beyond the individual, and (c) enhanced argument building with visualization tools, ideally with collaborative capabilities. This tested strategy with recommended adjustments addresses the call for pedagogical approaches to meaningfully apply OERs for learning.

Future researchers may be interested in examining students' historical thinking in an updated system that supports these enhanced features. Also recommended is research into systems that support user tracking, so that precise relationships can be examined — such as how the number and type of associational searches impacts subsequent usage of case material in claims and justifications in action plans.

Future research would also benefit from examining ability-based relationships — for example, does a student's score on a cognitive measure like the Cognitive Flexibility Inventory (Dillon & Vineyard, 1999) predict how well they will justify claims and action plans with case material or willingly integrate others' points of view during discussion? If patterns in user activity or cognitive flexibility are meaningful, scaffolds may be tested for learners who are using systems inappropriately or expressing cognitive inflexibility.

References

- Anderson, C., Day, K., Michie, R., & Rollason, D. (2006). Engaging with historical source work: Practices, pedagogy, and dialogue. *Arts & Humanities in Higher Education*, 5, 243–263. <https://doi.org/10.1177/1474022206067623>
- Bliss, T. J., Robinson, T. J., Hilton, J., & Wiley, D. A. (2013). An OER coup: College teacher and student perceptions of open educational resources. *Journal of Interactive Media in Education*, 2013(1), 1–25. <https://doi.org/10.5334/2013-04>
- Brent, I., Gibbs, G. R., Gruszczynska, A. K. (2012). Obstacles to creating and finding open educational resources: The case of research methods in the social sciences. *Journal of Interactive Media in Education*, 2012(1), 1–17. <https://doi.org/10.5334/2012-05>
- Carini, P. (2009). Archivists as educators: Integrating primary sources into the curriculum. *Journal of Archival Organization*, 7, 41–50. <https://doi.org/10.1080/15332740902892619>
- Cleary, P., & Neumann, D. (2009). The challenges of primary sources, collaboration, and the K–16 Elizabeth Murray project. *The History Teacher*, 43, 67–86.
- Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: Sage.
- Demetriadis, S. N., Papadopoulos, P. M., Stamelos, I. G., & Fischer, F. (2008). The effect of scaffolding students' context-generating cognitive activity in technology-enhanced case-based learning. *Computers & Education*, 51, 939–954. <https://doi.org/10.1016/j.compedu.2007.09.012>
- Demetriadis, S. N., & Pombortsis, A. (1999). Novice student learning in case based hypermedia environment: A quantitative study. *Journal of Educational Multimedia and Hypermedia*, 8, 241–269.
- Dillon, R. F., & Vineyard, G. M. (1999). *Cognitive flexibility: Further validation of flexible combination*. Retrieved from ERIC database. (ED435727)
- Doolittle, P. E., & Hicks, D. (2003). Constructivism as a theoretical foundation for the use of technology in social studies. *Theory and Research in Social Education*, 31, 72–104. <https://doi.org/10.1080/00933104.2003.10473216>
- Endacott, J. (2005). It's not all ancient history now: Connecting the past by weaving a threaded historical concept. *The Social Studies*, 96, 227–231. <https://doi.org/10.3200/TSSS.96.5.227-232>
- Feltovich, P. J., Spiro, R. J., & Coulson, R. L. (1989). The nature of conceptual understanding in biomedicine: The deep structure of complex ideas and the development of misconceptions. In D. A. Evans & V. L. Patel (Eds.), *Cognitive science in medicine: Biomedical modeling* (pp. 113–172). Cambridge, MA: The MIT Press.
- Fillpot, E., Tursi, J. L., Heckart, K., Hippen, C., Hippen, J., Litchfield, P., ... Williamson, T. (2010). *Analyzing original sources: The Bringing History Home five processes*. Retrieved from <http://www.bringinghistoryhome.org/fiveprocesses>

- Gurell, S., Kuo, Y.-C., & Walker, A. (2010). The pedagogical enhancement of open education: An examination of problem-based learning. *International Review of Research in Open and Distance Learning*, 11(3), 95–105. <https://doi.org/10.19173/irrodl.v11i3.886>
- Hassler, B., Hennessy, S., Knight, S., & Connolly, T. (2014). Developing an open resource bank for interactive teaching of STEM: Perspectives of school teachers and teacher educators. *Journal of Interactive Media in Education*, 2014(1), 1–24. <https://doi.org/10.5334/2014-09>
- Hatzipanagos, S., & Gregson, J. (2015). The role of open access and open educational resources: A distance learning perspective. *The Electronic Journal of e-Learning*, 13, 97–105.
- Hicks, D., Doolittle, P. E., & Ewing, E. T. (2004). The SCIM-C strategy: Expert historians, historical inquiry, and multimedia. *Social Education*, 68, 221–225.
- Jacobson, M. J., & Archodidou, A. (2000). The design of hypermedia tools for learning: Fostering conceptual change and transfer of complex scientific knowledge. *Journal of the Learning Sciences*, 9, 145–199. https://doi.org/10.1207/s15327809jls0902_2
- Jacobson, M. J., & Spiro, R. J. (1995). Hypertext learning environments, cognitive flexibility, and the transfer of complex knowledge: An empirical investigation. *Journal of Educational Computing Research*, 12, 301–333. <https://doi.org/10.2190/4T1B-HBPO-3F7E-J4PN>
- Jonassen, D. H., & Hernandez-Serrano, J. (2002). Case-based reasoning and instructional design: Using stories to support problem solving. *Educational Technology Research & Development*, 50(2), 65–77. <https://doi.org/10.1007/BF02504994>
- Kim, H., & Hannafin, M. J. (2008). Grounded design of web-enhanced case-based activity. *Educational Technology Research & Development*, 56, 161–179. <https://doi.org/10.1007/s11423-006-9010-9>
- Lee, J. K. (2010). Digital history and the emergence of digital historical literacies. In R. Diem & M. J. Berson (Eds.), *Technology in retrospect: Social studies in the information age 1984–2009* (pp. 75–90). Charlotte, NC: Information Age Publishing.
- Liu, M., Bera, S., Corliss, S. B., Svinicki, M. D., & Beth, A. D. (2004). Understanding the connection between cognitive tool use and cognitive processes as used by sixth graders in a problem-based hypermedia learning environment. *Journal of Educational Computing Research*, 31, 309–334. <https://doi.org/10.2190/LK2G-8K25-RB8U-PGE9>
- Morgan, D. N., & Rasinski, T. V. (2012). The power and potential of primary sources. *The Reading Teacher*, 65, 584–594. <https://doi.org/10.1002/TRTR.01086>
- Niederhauser, D. S., Reynolds, R. E., Salmen, D. J., & Skolmoski, P. (2000). The influence of cognitive load on learning from hypertext. *Journal of Educational Computing Research*, 23, 237–255. <https://doi.org/10.2190/81BG-RPDJ-9FA0-Q7PA>
- Owensby, J. N., & Kolodner, J. L. (2002). *Case application suite: Promoting collaborative case application in learning by design classrooms*. Paper presented at the International

Conference on Computer Support for Collaborative Learning, University of Colorado, Boulder, CO.

Owings Swan, K., & Hofer, M. (2008). The Historical Scene Investigation (HSI) project: Facilitating historical thinking with web-based, digital primary source documents. *Journal of the Association for History and Computing*, 11(1). Retrieved from <http://hdl.handle.net/2027/spo.3310410.0011.101>

Perryman, L-A., & Coughlan, T. (2014). When two worlds don't collide: Can social curation address the marginalisation of open educational practices and resources from outside academia? *Journal of Interactive Media in Education*, 2014(2), 1–12. <https://doi.org/10.5334/jime.ab>

Schmidt, C. (2007). Effects of a case-based reasoning system on student performance in a Java programming course. *Journal of Information Systems Education*, 18, 437–445.

Spiro, R. J., Collins, B. P., & Ramchandran, A. R. (2007). Modes of openness and flexibility in cognitive flexibility hypertext learning environments. In B. H. Khan (Ed.), *Flexible learning in an information society* (pp. 18–25). <https://doi.org/10.4018/978-1-59904-325-8.ch002>

Spiro, R. J., Coulson, R. L., Feltovich, P. J., & Anderson, D. K. (1988). *Cognitive flexibility theory: Advanced knowledge acquisition in ill-structured domains*. Retrieved from ERIC database. (ED302821)

Spiro, R. J., & Jehng, J.-C. (1990). Cognitive flexibility and hypertext: Theory and technology for the nonlinear and multidimensional traversal of complex subject matter. In D. Nix & R. J. Spiro (Eds.), *Cognition, education, and multimedia: Exploring ideas in high technology* (pp. 163–205). Hillsdale, NJ: Lawrence Erlbaum Associates.

Stanford History Education Group. (2016). *Reading like a historian* [Online curriculum]. Retrieved from <https://sheg.stanford.edu/rlh>

Strobel, J., Jonassen, D. H., & Ionas, I. G. (2008). The evolution of a collaborative authoring system for non-linear hypertext: A design-based research study. *Computers & Education*, 51, 67–85. <https://doi.org/10.1016/j.compedu.2007.04.008>

Tally, B., & Goldenberg, L. B. (2005). Fostering historical thinking with digitized primary sources. *Journal of Research on Technology in Education*, 38, 1–21. <https://doi.org/10.1080/15391523.2005.10782447>

Tawfik, A., & Jonassen, D. (2013). The effects of successful versus failure-based cases on argumentation while solving decision-making problems. *Educational Technology Research & Development*, 61, 385–406. <https://doi.org/10.1007/s11423-013-9294-5>

Wang, F.-K., Moore, J. L., Wedman, J., & Shyu, C.-R. (2003). Developing a case-based reasoning knowledge repository to support a learning community—An example from the technology integration community. *Educational Technology Research & Development*, 51(3), 45–62. <https://doi.org/10.1007/BF02504552>

Westerman, E. B. (2014). A half-flipped classroom or an alternative approach? Primary sources and blended learning. *Educational Research Quarterly*, 38(2), 43–57.

Wiley, J., & Voss, J. (1996). The effects of "playing" historian on learning in history. *Applied Cognitive Psychology, 10(7)*, 63-72. [https://doi.org/10.1002/\(SICI\)1099-0720\(199611\)10:7<63::AID-ACP438>3.0.CO;2-5](https://doi.org/10.1002/(SICI)1099-0720(199611)10:7<63::AID-ACP438>3.0.CO;2-5)

Wineburg, S., Martin, D., & Monte-Sano, C. (2012). *Reading like a historian* (2nd ed.). New York, NY: Teachers College Press.

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Appendix A Student Worksheet

Step 1: Chronological Reading (Summarizing). The first step in this project is to read a set of letters (cases) that provide background context on living conditions for slaves on southern plantations in the 1840s. Letters (or "mini-cases") have been purposely selected to provide context on a set of health-related themes: childbirth, death, infant mortality, and disease; medicine and doctors; clothing, food, and housing; workload; and weather. The letters shown in the grid below are listed in chronological order. I suggest reading them chronologically as some embedded story lines will make more sense in this order. To access the first letter, go to the Plantation Letters document viewer and search on one of the themes for that letter (e.g., to retrieve and read the Cameron, 1844-09-05 letter, you could run a search on "disease," "doctors," and/or "clothes"). I suggest reading the transcribed version of each retrieved letter, as the transcriptions are considerably more legible than the originals. Please read each letter in its entirety and the entire list of letters in one sitting. It should take you no longer than 80–100 minutes to read the entire list of letters, as some are very short. As you go through the letters please record facts, figures, and your initial thoughts in the section "notes" below.

Letters	childbirth	death, mortality	disease	doctors	clothes	food	houses	workload	weather
Cameron, 1844-09-05			x	x	x				x
Cameron, 1844-11-27			x			x	x		
Cameron, 1844-12-07						x	x		x
Cameron, 1845-01-04		x					x		
Lewellyn, 1845-05-11	x	x				x			x
Lewellyn, 1845-07-03					x	x			x
Lewellyn, 1845-08-01		x	x						
Lewellyn, 1845-08-16								x	
Lewellyn, 1845-09-04					x				x
Cameron, 1845-11-18					x	x		x	x
Lewellyn, 1846-06-25			x	x					x
Lewellyn, 1846-08-30	x	x							x
Lewellyn, 1846-09-10								x	x
Lewellyn, 1846-09-21		x	x	x					
Lewellyn, 1846-09-30								x	
Ring, 1846-09-23			x	x					
Lewellyn, 1846-10-11				x					

Bennehan, 1846-10-22			x	x					x
Lewellyn, 1846-10-22			x	x					
Lewellyn, 1846-11-03	x	x		x					x
Lewellyn, 1847-01-08		x				x			
Lewellyn, 1847-02-27		x				x			x
Lewellyn, 1847-03-23	x	x			x				x
Lewellyn, 1847-04-03									x
Lewellyn, 1847-05-01					x	x			x
Lewellyn, 1847-05-21		x			x				
Lewellyn, 1847-06-29				x					
Moore, 1847-07-26			x	x					x
Lewellyn, 1847-07-31							x		x
Cameron, 1847-09-28		x		x	x				
Lewellyn, 1847-10-20			x			x			
Cameron, 1847-11-08		x		x		x			x
Cameron, 1847-12-09			x						

NOTES: While reading letters, note any relevant facts or figures, along with your initial thoughts here:

childbirth, death, mortality, disease	
medicine and doctors	
clothing, food, and housing	
workload	
weather	

Step 2: Contextualizing, Corroborating. The following questions are suggestive of some possible theme combinations (e.g., disease AND doctors, health AND workload). Go back to the Plantation Letters database and use the Boolean search option to identify letters where two themes are discussed across several letters. You choose the themes to search for. Are you able to identify any trends? You may end up reading a letter more than once, but that's the point of traversing—you will see the letter in different contexts as you search using different theme combinations. Please provide a written response to the following questions. In your responses, please reference general or specific items you found in the letters (e.g., "in several of the letters, there was a lot of talk about X; therefore..."). You may

quote sparingly from specific letters, although you are not required to do so. Approximately 250–350 words per question should be adequate.

1. What was the general health of slaves on the described plantations?	
2. How were slaves treated when ill?	
3. Do you think slaves were provided with the basic necessities to maintain good health?	
4. Do you think the slaves' workload could have contributed to poor health?	

Step 3: Drawing on Modern-Day Perceptual Overlays to Make Claims About the Past. In this step, you are being asked to reflect on the letters again through a modern-day lens. You've been given access to a number of short articles that describe modern-day public health crises arising in Africa, Haiti, and also the United States. First, read the articles and note the conditions suggested by experts for public health crises (e.g., lack of sanitary drinking water). Second, note any similar conditions that were at play on the plantations described in the letters you read.

Conditions at Play in Modern-Day Public Health Crises	Similar Conditions at Play on Southern Plantations

Based on conditions contributing to modern-day public health crises, and what you've read about living conditions and health on southern plantations, would you say slaves were facing a public health crisis by today's standards? Why or why not? Discuss at least four factors in your conclusion. Approximately 250–350 words should be adequate.

Step Four: Transfer and Transformation, Writing Informed Action Plan. Based on your research into conditions that can support and hinder human health, you've been invited by the Japanese government to an emergency consultation on the recent earthquake and tsunami that destroyed all vital infrastructure along the northeast coast. In the first two weeks of disaster response, what do you see as the four top priorities to ensure the health of the affected population? Reference other cases from your research into modern-day health crises and southern plantations to justify your priorities.

Step Five: Reflecting with Others. Repost your step four conclusion regarding public health crisis and your step five transfer plan on the designated discussion forum and comment on at least three peer conclusions and three peer transfer plans.