

A Digital View of History: Drawing and Discussing Models of Historical Concepts

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Technology and the History Classroom

History teachers appear to be among the slowest adopters of technology in the classroom.¹ This may be due largely to a tenacious belief that good history education requires covering content through lecture. This notion of history education reflects a view of education as a form of passive transmittal. In addition, in classrooms where teachers go beyond the recall of facts and engage students actively in the construction of historical knowledge, teachers might experience students who prefer the “path of least resistance.”² According to VanSledright, students have become adept in their role as “consumers of what is being pedagogically reproduced,” and feel most comfortable and familiar in a passive role as a listener, not as a thinker, in the classroom.³ History may also be “counterintuitive” to students: “Everyday ideas about a past that is given can make it difficult for students to understand basic features of doing history.”⁴ Students often do not understand how competing interpretations about the past could exist, and it takes considerable work on the part of teachers to help students develop the “second order concepts that give shape to the discipline of history.”⁵ As a result, while students may be digital natives, they need teachers to guide them in using technology for learning.

Digital History

Digital history refers to “the study of the past using a variety of electronically reproduced primary source texts, images, and artifacts as well as the constructed narratives, accounts, or presentations that result from digital historical inquiry.”⁶ Access to digitized primary sources can promote active instruction in historical thinking. A powerful way to use digital history in the classroom is to engage students in “doing history” by reading and analyzing digitized primary sources and then articulating their historical

interpretations by drawing conceptual models.

Modeling Historical Concepts

Originally developed for physics, the modeling pedagogy engages students in inductive inquiry to create a visual representation of a theoretical framework and conceptual understanding. In the field of the social studies, the modeling pedagogy resonates with practitioners who embrace an inquiry-oriented or constructivist approach to teaching historical concepts and ask their students to “do

history.”⁷ Students develop historical thinking skills as they examine original, historical evidence and develop their own interpretations about the past.⁸ According to Milson, “The research base has indicated that students learn history most effectively when they are engaged in asking historical questions, collecting and analyzing historical sources, and determining historical significance.”⁹ The modeling pedagogy applied to the study of history, including the integration of primary sources and group deliberation, culminates in the student presentation of a “model,” or an “external representation,” to describe the historical phenomenon under study.¹⁰ Whereas writing is a common external representation used to move students toward deeper historical understanding, here students create visual diagrams, in the most simple, general terms possible, to describe their understandings about the past.¹¹

Below we describe a lesson in which modeling pedagogy and digital history are combined to teach about the Great Plague that hit Europe in the mid-fourteenth century. This lesson is designed to encourage teachers to go beyond using technology for didactic history instruction. We believe similar strategies can be

Figure 1. **Statistics on price of herring and continental wine**

Year	Herring	Wine	Year	Herring	Wine	Year	Herring	Wine
1259	42.25	15.25	1307			1355	160	
1260			1308	100	22	1356	212.5	80
1261		30	1309		80	1357		
1262			1310	81		1358	153.75	
1263	71.5	27	1311	117		1359	141.25	
1264	68	30	1312		14	1360		70
1265		23	1313		26	1361	160	80
1266	48		1314		26	1362		
1267	57.5		1315		56	1363		
1268	51.25		1316	126	40	1364	160	99
1269	50		1317	135		1365	160	89
1270			1318		56	1366		85
1271	50.75		1319	130	50	1367	160	100
1272	57.25	29	1320	105		1368		76
1273	58.5	26	1321		46	1369	160	80
1274	38	26	1322	140	46	1370		107
1275	46.75		1323		46	1371	160	120
1276	80	26	1324	80	20	1372	195	
1277	72.5	30	1325	100	24	1373		86
1278	40		1326	80	53	1374	160	
1279	91.5		1327		47	1375	160	
1280	75.5	21	1328		53	1376	206.5	80
1281	97.5		1329	86.25	53	1377	180	
1282	82.25	40	1330		46	1378	160	
1283	100		1331	90.25	46	1379	160	
1284	100		1332		40	1380		
1285	70.5		1333	120	46	1381	160	
1286	64		1334	100	43	1382		74
1287	55.5		1335	120	49	1383	160	80
1288	55.5		1336	130		1384		100
1289	85	20	1337	100	46	1385	200	100
1290	56.5	16	1338	120		1386	200	71
1291	58.75	11	1339			1387	180	80
1292	71.75	11	1340	93.5		1388		70
1293	84	12	1341			1389	200	80
1294	86.75	12	1342	110		1390		60
1295	81.25		1343			1391	200	
1296	94.75		1344			1392	200	75
1297	70	10	1345	129.5		1393	240	66
1298	68.5	20	1346			1394	240	56
1299	139.25	38	1347	91.5		1395	130	
1300	54	19	1348	112.5		1396	240	60
1301			1349			1397	240	60
1302		21	1350		100	1398		80
1303		20	1351			1399	240	70
1304	81		1352	160		1400		60
1305	75.5		1353		70			
1306			1354	160				

This is an example from the statistical work the students did prior to creating the models for the Great Plague. Here, the students recorded statistics for the average price of herring and wine each year (depending on the availability of primary source information). The prices are in British pence. The quantities for which the prices were paid were: 1,200 herrings, and 12 gallons of wine.

used with other topics in history and, by extension, throughout the humanities and social sciences.

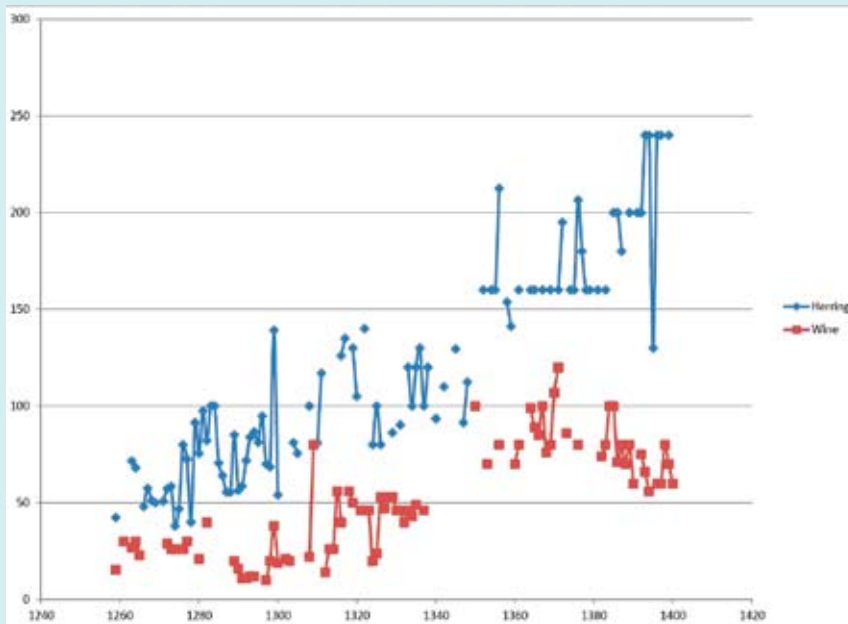
The Plague Lesson

Prior to the modeling session, the teacher should present the class with a broad description of the project and provide access to digital primary source materials that offer background knowledge. The teacher might also begin with a brief text reading. In a class taught by one of the

authors (Robert), students used *Fathom* software to examine statistics related to the incidence of Europe’s mid-fourteenth-century plagues.¹² These statistics were compiled by James E. Thorold Rogers in *A History of Agriculture and Prices in England, From the Year After the Oxford Parliament (1259) to the Commencement of the Continental War (1793)*.¹³ Based on these statistics—focusing on data from 1259–1500 CE—the students in Robert’s freshman high school world

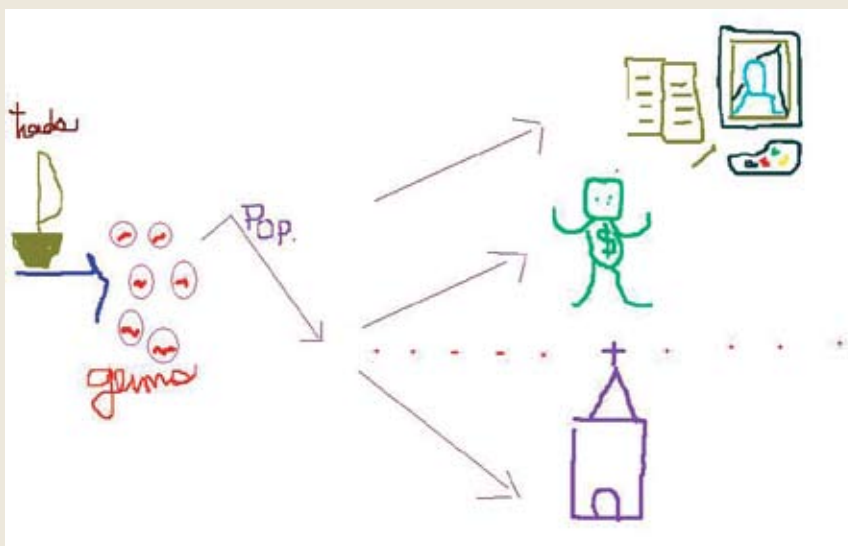
history class created charts and graphs on their tablet computers that depicted major economic trends related to the Great Plague (see Figure 1). The class was divided into groups of three, and each group was assigned a different set of data (e.g., grain, livestock, etc). They were asked to infer the relationships between the plague data and the effects of the plagues on the economy, politics, intellectual beliefs, culture, and society. They were also confronted with dif-

Figure 2. Plot graph of price of herring and wine



Students have created a plot graph to illustrate the trend in prices over the course of the time period.

Figure 3. Conceptual model of the social effects of the Great Plague



This is an example of a model for the Black Death. Here, the student is demonstrating the manner in which trade led to new diseases and a population decline, which in turn resulted in social change. The results included: (1) the reduced influence of the church, due to the high death rate among clergy serving the needs of the sick, as well as popular resentment that the Church was unable to stop the plague; (2) the increase in the cash economy as a result of a labor shortage leading to higher wages and of the growth of cash crops that were less labor-intensive; and (3) an artistic and literary renaissance fueled by money from merchants and tradespeople who did well in the growing economy.

ferential economic changes, e.g., the different impact disease and climate had on luxury good prices, food prices, and labor prices.

The students quickly noticed two “blips” in the economic data—one for the plagues and one for the beginnings of Europe’s “Little Ice Age” (ca 1300 CE). The students were forced to go back to the historical record to explain the appearance of both aberrations (see Figure 2). The students accepted the effects of the Great Plague as the explanation for the primary peak in prices and set upon searching for the underlying reason for the earlier, less pronounced spike. They concluded that Europe’s “Little Ice Age” was the most reasonable explanation for this early-fourteenth-century phenomenon. While there remained questions as to whether this long-range climactic shift was coincidental or causal to the changes in the English economy, the important lesson for the students was the quest for answers.

After students developed some background knowledge about the plague, the teacher presented the modeling challenge. In this case, the students were asked to create a model depicting the historic forces that defined the era of the Great Plague. Through graphic presentation and metaphor, students displayed how these forces played out in the economic, political, intellectual, cultural, and social sectors. Students needed to make a historic interpretation about the most significant factors defining the times and draw their mental model of the interconnections between the events and their effects (see the example in Figure 3).

Students can draw their models of their historic interpretations using an iPad, tablet PC or other personal computing device. Teachers can explore a variety of drawing tools to help students create a visual image of their conception of the historical event. For instance, iPad offers the robust *Magic Whiteboard Drawing* application for a fee and *Groupboard*, a free application

that turns an iPad into a group whiteboard. Software to create graphic organizers such as *Inspiration* may also be suitable.

In Robert's class, the construction of models about the medieval European plagues, based on the historical data they analyzed, pushed the students to make inferences regarding cause and effect and to ask deeper questions about why various natural forces had varying effects on historical events. At first, students went through a sifting process, eliminating topics that were tangential or too broad, and deciding what, ultimately, to include on the board and in their model. Next, the diagram began to evolve. As students drew, they were compelled, by questions posed by their peers, to explain their reasoning behind their work. Inconsistencies were revealed, requiring revisions to the diagram, but also to the student's initial idea. Students revised their diagram to reflect their growing theoretical framework, the "forest" that they had extracted from the "trees" of the materials gleaned through reading, presentations by the teacher, and other means. For example, through modeling and discussion students noticed that seemingly disconnected commodities and occupations—metals and wine, sheep and fish, oats and carpentry—were part of an intricate and interdependent web.

Throughout the process of students creating their models or visualizations, it is important for the teacher to main-

tain the role of facilitator. Robert moved from group to group, listening carefully to what the students said, and asked strategic, clarifying questions. He described his supervision as a kind of "Socratic hovering," wherein the teacher asks students to reconsider or reframe an idea, while avoiding leading questions, hints, and judgments. This mode of teaching requires not only understanding of the sort of model the students should be developing, but also the ability to help students clarify the sometimes nebulous images in their minds.

After the students complete their models, they can be displayed using an LCD projector on a white board or with a SmartBoard. Students gather in a circle and participate in a peer-facilitated seminar in which they compare results and generate questions for other groups. The diagrams can serve as a springboard for a rich, student-led conversation. As students begin to describe their rationale and choices in creating the models or visualizations they develop deeper insights about the historical past and the work of historians. As students ask each other questions, they improve their skills in negotiating group dynamics, develop higher-order thinking skills, and master the material.

Conclusion

By pairing digital history resources with the modeling pedagogy, teachers can harness technology to engage students in "doing history." As students

draw their mental models, they begin to make connections and develop "second-order conceptual knowledge." Through this process, history becomes a process, rather than a fixed body of knowledge. If we wish to educate—to prepare thoughtful citizens for life in a complex world—then we should draw back the curtain and reveal how history is made. Through modeling, we can help students see their world with greater clarity and make them partners in historical discovery. 🌐

Notes

1. Adam Friedman, "Social Studies Teachers' Use of the Internet to Foster Democratic Citizenship" in *The Electronic Republic? The Impact of Technology on Education for Citizenship*, eds. Phillip Van Fossen and Michael Berson (West Lafayette, Ind.: Purdue University Press, 2008), 173-195; Phillip Van Fossen, "An Analysis of the Use of the Internet and World Wide Web by Secondary Social Studies Teachers in Indiana," *The International Journal of Social Education* 14, no. 2 (1999-2000): 87-109.
2. Andrew Milson, "The Internet and Inquiry Learning: Integrating Medium and Method in a Sixth Grade Social Studies Classroom," *Theory and Research in Social Education* 30, no. 3 (2002): 330-353.
3. Bruce VanSledright, *The Challenge of Rethinking History Education: On Practices, Theories, and Policy* (New York: Routledge, 2011), 25.
4. Peter Lee, "Putting Principles into Practice: Understanding History," *How Students Learn: History, Mathematics, and Science in the Classroom* (National Academies Press, 2005): 31-77.
5. Ibid, 41.
6. John Lee, "Digital History in the History/Social Studies Classroom," *The History Teacher* 35, no. 4 (2002): 504.
7. Keith Barton and Linda Levstik, "Why Don't History Teachers Engage Students in Interpretation?" *Social Education* 67 (2003): 358-61; Matthew Downey and Linda Levstik, "Teaching and Learning History: The Research Base," *Social Education* 52, no. 6 (1998): 336-342; Stuart Foster and Charles Padgett, "Authentic Historical Inquiry in the Social Studies

Digital Resources

Modeling Pedagogy

<http://modeling.asu.edu/modeling/synopsis.html>

Information on teaching with your iPad

<http://teachwithyouripad.wikispaces.com/>

More Digital Resources on the Great Plague

Path of the Black Death

<http://edsitement.neh.gov/lesson-plan/path-black-death>

Plague and Public Health in Renaissance Europe:

<http://www2.iath.virginia.edu/osheim/intro.html>

Description of effects of Black Death on Politics:

www.fordham.edu/halsall/source/froissart2.html

Art and Death in the Middle Ages

www.metmuseum.org/toah/hd/deth/hd_deth.htm

A Florentine, first-hand account, *The Decameron* of Giovanni Boccaccio

www.gutenberg.org/ebooks/23700

Economic data compiled by James E. Thorold Rogers

http://openlibrary.org/works/OL10447556W/A_history_of_agriculture_and_prices_in_England

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- Classroom," *The Clearing House* 72, no.6 (1999): 357-63.
8. VanSledright, *The Challenge of Rethinking History Education*; Sam Wineburg, *Historical Thinking and Other Unnatural Acts: Charting the Future of Teaching the Past* (Philadelphia: Temple University Press, 2001).
9. Milson, 348.
10. Jan van Drie, Carla van Boxtel, Jos Jaspers, and Gellof Kanselaar, "Effects of Representational Guidance on Domain Specific Reasoning in CSCL," *Computers in Human Behavior* 21 (2004): 575-602.
11. James Voss and Jennifer Wiley, "Developing Understanding While Writing Essays in History," *International Journal of Educational Research* 27, no. 3 (1997): 255-265.
12. Fathom is a software program designed for algebra and statistics instruction (see: www.keypress.com/x5656.xml). Here, it was used to help the students analyze real world data by inputting economic information and then plotting this data as graphs.
13. A digital copy of James E. Thorold Rogers's *A History of Agriculture and Prices in England* is available from <http://openlibrary.org>.

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