

MAPPING THE TRANSFORMATION OF INFORMATION INTO KNOWLEDGE IN EARLY MODERN FLORENCE: USING THE *DECIMA PROJECT* TO ASSESS HIGHER ORDER THINKING SKILLS THROUGH STUDENT REFLECTION

Jennifer Mara DeSilva

Ball State University

“L’Orsolina Bolognese was a *meretrice* or prostitute living in Florence, Italy in 1561 [... She] rented a house from Camilla Pistolesse, widow to Stefano Fenovese, for 13.5 *scudi*. [...] The parish in which L’Orsolina lived in was St. Paulo and she lived on Via Palazzuolo, where 15 other prostitutes resided.”¹

Mapping is having a moment, both in scholarship as a further development of the spatial turn, and in society where we find map-a-thons, apps that allow us to map and share our experiential and cultural world, and an increasing reliance on global positioning systems (GPS) to move people and goods efficiently. Thus, it should be no surprise that maps also provide an opportunity for students to develop and interpret their historical knowledge in new and vibrant ways. Maps have long offered ways of understanding contemporary cultural models and relationships between peoples and characteristic geography. While the seventeenth-century continental maps in Willem Blaeu’s atlases reveal how Europeans visualized other people across the globe, they offer few connections with the communities

1 S1, Final Project from HIST 497: Social History of Renaissance Europe, Ball State University, Fall 2018. To protect student anonymity, student names have been replaced with indicators (S1, S2, S3, etc.).

that they purport to illustrate. The distance between cartographer and community limits the usefulness of these maps as portals into the daily experiences of the communities portrayed.

The recent use of geographic information systems (GIS) to visualize datasets across historical maps has allowed a greater investigation of both communities and the lived experience. Large-scale materials, like census data, that were previously available only in blind databases or distant archives, have become available to the classroom through multi-year funded projects.² The University of Toronto's *DECIMA Project* (Digitally Encoded Census and Information Mapping Archive) presents an open-access platform through which anyone can explore census material collected in early modern Florence.³ Layered upon a city map, produced by Stefano Buonsignori in 1584, are three censuses corresponding to a 1551 demographic study, a 1561 property tax survey (Decima Granducale), and a 1632 post-plague population assessment.⁴ Conceived of as a spur to historians exploring both the household and the city level, projects like this one are a boon to students of social, spatial, and economic history.

Projects that make large historical datasets accessible are particularly useful to history instructors who seek real-world platforms that support an open-ended investigation of past societies. In combination with evidence-based instruction and discussion, mapped census data offers excellent opportunities for disciplinary work focusing on “connection, integration,

² For similar work on London, England, see *The Map of Early Modern London* (The University of Victoria), <https://mapoflondon.uvic.ca> and *Locating London's Past* (University of Hertfordshire, the Institute for Historical Research, University of London, and University of Sheffield), <https://www.locatinglondon.org>.

³ *DECIMA* (2016), <https://decima-map.net/>.

⁴ Nicholas Terpstra, introduction to *Mapping Space, Sense, and Movement in Florence: Historical GIS and the Early Modern City*, eds. Nicholas Terpstra and Colin Rose (London: Routledge, 2016), 3-7.

motivation, and significance.”⁵ This article explores how senior undergraduate students worked with the *DECIMA Project* on research-based learning assignments that they developed independently. Student reflection is central to evaluating the higher order thinking skills that this project embodies. In their own words students reflect on their intellectual processes and acknowledge growth in the discipline, allowing a more informative analysis and valuation of this type of project. Specific criteria assessed the resulting student work in order to evaluate several cognitive abilities that students employed during their method design, data analysis, and the contextualization of conclusions (Appendix 2).⁶ This article argues that the *DECIMA Project* facilitates the evaluation of student capability within a much larger arena and thus employs a complex combination of cognitive processes and skills suitable for an upper-level undergraduate history course.

Census City: Florence and the *Catasto* of 1427 and the *Decima* of 1561

The city of Florence has a long history of public surveys. From the early 1400s during a series of wars with the duchy of Milan, the Florentine republican government experimented with several direct and indirect taxation strategies. In 1427, the new *Law of the Catasto* asserted that Florentine households would be assessed based on all forms of wealth through a series of urban and rural surveys that depended on the submission of household declarations.⁷ Although the city repealed the *Law* in 1434, this

5 Sam Wineburg, “Beyond ‘Breadth and Depth’: Subject Matter Knowledge and Assessment,” *Theory into Practice* 36, no. 4 (1997): 257.

6 This assignment also drew on several taxonomic categories including “create,” “analyze,” and “evaluate” from the revised version of Bloom’s Taxonomy. L.W. Anderson and D.R. Krathwohl, eds., *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom’s Taxonomy of Educational Objectives* (New York: Longman, 2001).

7 David Herlihy and Christiane Klapisch-Zuber, *Tuscans and their Families*:

brief period resulted in one of the most extensive investigations of population and resources in the early modern period. Sixty thousand households in the Florentine city and countryside appeared in the resulting declarations and registers, most of which survive in the Archivio di Stato in Florence, Italy.⁸ While this Florentine census is the best known and has been mined extensively by historians David Herlihy and Christiane Klapisch-Zuber, its online records are vast (c.10,000 declarations) but not easy to use or integrated spatially.⁹

In contrast to the *Catasto*'s SQL (Structured Query Language) searches, the surveys conducted by Duke Cosimo I Medici of Florence appear more accessible and visually appealing. Under the direction of Nicholas Terpstra and Colin Rose, three later surveys of Florentine households have been geo-referenced to a map of the city prepared for Cosimo's son, Duke Francesco I, and made available online. The 1561-62 tax census, called the *Decima Granducale* after the ten per cent tax (*decima*) that it levied, is the centerpiece of the website. Census officials traveled from house to house and street to street across all four urban quarters, methodically interviewing residents and documenting household size and property valuation, as well as the location of workshops and places of business (*botteghe*). The large size of Buonsignori's bird's-eye view map (123 x 128 cm) allowed a high-resolution scan that facilitates a clear street-side view of individual houses, workshops, and churches.¹⁰ Thus, visitors can follow the census-

A study of the Florentine Catasto of 1427 (New Haven, CT: Yale University Press, 1985), 4-12.

8 *Ibid.*, 22-27.

9 David Herlihy, Christiane Klapisch-Zuber, R. Burr Litchfield, and Anthony Molho, *Online Catasto of 1427*, <http://cds.library.brown.edu/projects/catasto/main.php>.

10 Nicholas Terpstra and Colin Rose, "DECIMA: Digitally Encoded Census Information and Mapping Archive, and the Project for a Geo-Spatial and Sensory Digital Map of Florence," *The Journal for Early Modern Cultural Studies* 13, no. 4 (Fall 2013): 156-157.

takers house by house or investigate the clustered dwellings that make up some of the more crowded neighborhoods. Taken together via the *DECIMA Project's* user-friendly platform, the ducal census and Buonsignori's map allow more varied investigations of the city than the *Catasto* of 1427.

The Classroom Context

As educational psychologist Sam Wineburg has argued, the challenge in teaching is bridging “the chasm between knowing x , and using x to think about y .”¹¹ Most students cannot immediately imbibe information and return it to the instructor in a new and more complex relational format, yet that is the central goal of many upper-year university courses.¹² So how do students transition from classroom discussions that piece the past together through a variety of curated documents and images to using open-ended census data to build a larger independent understanding of past cultures and experiences? Periodic reflection is key to ensuring that students become observers of their own intellectual development, as well as the progress of their project. Not only is the act of thinking about a person, place, or activity essential to both the retention of information and a deeper understanding of its meaning, but reflection allows a space for commentary, comparison, and constructive self-criticism.¹³ To ensure that assignments and their learning goals are achievable, they must grow out of appropriate background knowledge, not overload working memory, and require skills equal to the average student's

11 Wineburg, “Beyond ‘Breadth and Depth,’” 256.

12 The departmental Student Learning Outcome linked to this assignment required students to practice the acquisition and critical evaluation of information facilitating the discernment of patterns, nuance, and context amidst complexity.

13 Terry Haydn, “Secondary History: Current Themes,” in *Debates in History Teaching*, 2nd edition, ed. Ian Davies (London: Routledge, 2017), 24; Daniel T. Willingham, *Why Don't Students Like School?* (San Francisco, CA: Jossey-Bass, 2009), 54.

expectation.¹⁴ To this end, the DECIMA assignment, which focused on a single community in early modern Italy, was the culmination of a broad investigation of life across Europe in the period from 1300 to 1700 CE in a seminar that followed the lifecycle, beginning at birth and ending at death. Students read primary sources and participated in classroom discussions that deconstructed early modern depictions in order to explore the early modern mentality and community structure.

The final third of the semester-long course was devoted explicitly to working with census documents and the *DECIMA Project*. A slow pace with regular classroom work time ensured that there was an opportunity for students to learn together steadily, maintain continuity with earlier discussions, allow reflection, and insert checkpoints for student understanding throughout the process (See Appendix 1). In Week 1 students came face to face with census returns, confronted the limitation of information, and considered how applying census data to a physical map could extend social knowledge in new directions. Most students are too young to have any experience submitting census questionnaires themselves and sometimes struggle to envision the early modern household at a variety of income levels. This was evident from student comments that focused on differences between modern and early modern households. One student expressed surprise at the rarity of nuclear families and the wide variety of extended families, including the Jacopo household that numbered forty-seven members.¹⁵ Another student noted with interest that “the Catasto defined the *famiglia* [family] as people related to each other by blood or marriage, and bounded together by obligations of mutual support, rather than by the physical people cohabiting in one home.”¹⁶ These reflections show students’ awareness of the differences between the past and the

14 Willingham, *Why Don't Students Like School?*, 15.

15 S2, *Tuscans and their Families* Synopsis and Reflection Paper.

16 S3, *Tuscans and their Families* Synopsis and Reflection Paper.

present, and a willingness to consider multiple practices. This open mindset is essential for students entering a new society and pursuing open-ended investigations.

In Week 2, readings built on census data recapitulated many of the ideas discussed using primary sources in earlier weeks. Chapters drawn from David Herlihy and Christiane Klapisch-Zuber's study of the Florentine *Catasto* of 1427 returned to issues of age of maturity, gendered differences in work and residence, gendered mortality rates, poverty and charity, and connections between work and wealth. The purpose of these readings was three-fold: to provide more information about the census projects, to show how a limited dataset could answer big questions, and to offer an investigative model to emulate. This third purpose was evident to a student who identified the parallels between the historians' process and our own in-class interactions:

Analyzing the written and unwritten history is part of what Herlihy and Klapisch-Zuber hoped to uncover by researching deeper with the *Catasto*. We have done similar things in class when analyzing documents related to our discussions. For example, when we analyzed a Danish law that stated all unmarried people had to register with the local government, we looked at the document beyond its legal history and into the social and cultural implications of the law.¹⁷

Another student revealed the readings' second purpose when noting:

The *Catasto*, though at first glance perhaps a seemingly boring tax census, provides rich data which Herlihy and Klapisch-Zuber were able to extrapolate out in order to create a working social history of the Tuscan area circa 1427. Many of their conclusions connect to discussions we've had in class,

17 S4, *Tuscans and their Families* Synopsis and Reflection Paper.

especially with regard to gender.¹⁸

These comments, drawn from student reflections, suggest a deeper understanding of the relationship between class readings and discussions and how those discussions mirror the work of published historians.

The integration of both data and conclusions drawn from the 1427 *Catasto* into earlier class discussions also prepared students for thinking about how to formulate questions that are answerable by census data. One student clearly identified the procedural path forward, writing:

[t]he *Catasto* presents raw data that historians like Herlihy and Klapisch-Zuber can use in tandem with other resources and documents to complete a historical picture of a specific time and place. It allows them to uncover discrepancies and create new questions to issues that were perhaps never considered before.¹⁹

After exploring the 1427 *Catasto*, the class moved on to the more complex *DECIMA Project* of 1561. While this project has put the census materials online as an open-access geocoded portal, there is no similar all-encompassing study as there is for the 1427 *Catasto*. Instead, current scholarly research has provided a frame for understanding and using the *Project* and encouraged historians to proceed according to their own research agenda. To provide some structure and inspiration, students read a selection of essays edited by Terpstra and Rose, which allowed them to see how other historians have formulated and defended theories with *Decima* census data.²⁰ In reflecting on the centrality of geography

18 S3, *Tuscans and their Families* Synopsis and Reflection Paper.

19 S4, *Tuscans and their Families* Synopsis and Reflection Paper.

20 Nicholas Terpstra and Colin Rose, eds., *Mapping Space, Sense, and Movement in Florence: Historical GIS and the Early Modern City* (London:

in Sharon Strocchia and Julia Rombough's work exploring convents through the *DECIMA Project*, one student wrote:

The large amount of properties that were [*sic*] that belonged to the various nun's [*sic*] families is what surprised me the most. [...] I find this widespread trend of families using their female relatives in religious life as social gain both unusual and interesting. It's unfamiliar to me to see that the humble service of cloistered life was used to raise families' status. But it is even more interesting to see the evidence from the maps, and the conclusions made by Strocchia and Rombough that this method was very successful.²¹

While this seems like an innocuous observation, highlighting surprise and diverse social practice, it became the foundation of an investigation exploring neighborhood wealth, strategy, and institutional impact.

Without Weeks 1 and 2 functioning as a *quasi* review phase that allowed further scaffolding of ideas, students without any experience using census data might find the assignment overwhelming. In order to concretize the scaffolding process, students prepared synopsis and reflection papers based on these readings, which also helped them put their interests and ideas into words, as seen in the previous student's comments on convents and social strategy. These papers offer students a space to connect new information with their own surprise or interest, thus indicating how they are interacting intellectually or emotionally with the readings. Reflecting on one of the *DECIMA* chapters, a student cited a disconnect between what she expected based on her own experience and what the scholarship revealed:

I was similarly interested in that the institutions owned

Routledge, 2016).

21 S5, *Mapping Space* Synopsis and Reflection Paper.

property and made (actually pretty good) profit from it. Perhaps it's my secular upbringing, but I didn't even think about how churches could own property and act as landlords to their congregations. It really brings Christianity further into the home and life in a way that I think I have trouble understanding from a modern perspective.²²

While the previous student expressed interest in early modern social practice, another student focused on the practice of social history. This student expressed surprise at the central role of numeric or quantitative data alongside more qualitative evidence:

This chapter was insightful to me. [...] I never realized the amount of social history that was could be [*sic*] taken from the data. These historians took so much information from this data and turned it into some interesting subjects. I am excited to work with it myself.²³

This enthusiasm suggests that reading studies by published historians showed students possible paths of interest and provided models for emulation.

Concurrent in-class discussion emphasized articulating observations in order to help students move from reading to analysis.²⁴ Isolating information was the first step in the investigative process that continued towards applying that information to answer questions, which, ultimately, could lead to larger social conclusions. The classroom process across these

22 S6, *Mapping Space* Synopsis and Reflection Paper.

23 S2, *Mapping Space* Synopsis and Reflection Paper.

24 Most synopsis and reflection papers balanced these two parts relatively well. In a couple of cases, papers that showed minimal reflection on the readings came from students who would struggle with present-mindedness in their final paper. This underlines the importance of early opportunities for student reflection and establishing an environment in which students are comfortable proposing and questioning their own understandings.

weeks acted as a communal and vocalized practice session for the individual process that students would complete as they developed project proposals in Week 3. Because of this practice character, it was imperative that students participated vocally in these discussions. Working in small groups, students read individual census returns in order to consider what information was present in the returns, how they could categorize that information, and what sort of questions it might answer. These collaborations assisted quiet and anxious students, who were less likely to contribute in front of the entire class, while allowing the instructor to show how together the groups had built a greater understanding out of their collected observations. Student anxiety generally coalesced around a perceived (but incorrect) need for mathematical skill, as one student admitted: “When I first found out what the DECIMA was and that we were working on it, I was worried. I did not want to work with numbers, and I believed this kind of data would focus on economic, financial, and map data.”²⁵ Indeed, the instructor’s role as facilitator and scaffolder is crucial in appropriately framing and pacing the project, as well as ordering and juxtaposing students’ observations.²⁶

For students, charting a first research path often depends on engaging in a combination of mimicry and individual exploration. While the 1427 *Catasto* has been conveniently and authoritatively explored by Herlihy and Klapisch-Zuber, the 1561 *Decima* is attractively accessible to undergraduates via an open-access platform. After an hour of in-class exploration, aided by English-Italian glossaries, students with no Italian-language skills move freely across the *DECIMA Project* website. One student affirmed this relatively small learning curve: “It took me a while to get used

25 S2, *Mapping Space* Reflection Paper.

26 John Oakley and Anne McDougall, “Census Data as Educational Resources,” *Education and Information Technologies* 2 (1997): 99; Barry K. Beyer, “What Research Tells Us about Teaching Thinking Skills,” *The Social Studies* 99, no. 5 (September-October 2008): 227-228.

to the DECIMA Project's GIS, but when I did I was able to see the beginnings of a pattern."²⁷ At the same time another student downplayed her grasp on the system only to detail just how much she had already achieved:

My research so far has been a majority of experimenting with the DECIMA map to get a grasp of how I can pull information from it. I have been able to locate the 'quarters' of the city, the streets where prostitution was allowed, and the poorer residences around the city. [...] I have a list of the convents that were in Florence during the time of the Decima census. With more time and examination of the map software, I believe I will be able familiar enough with the map to locate them.²⁸

Communal discussions about site usage and discoveries helped students gain confidence and develop their own project plans. Not only did students get to know the city's layout and its professional and housing patterns, but this was the beginning of students "using x to think about y." How might the distribution of bakers or butchers across the city reveal the place of their wares in early modern urban life? The integration of census data into earlier class discussions about wealth, poverty, work, and outsiders made the next phase—project development—easier, as students already understood the basic early modern mentality and now considered how space influenced or revealed experience.

As already noted, this assignment required students to develop a greater scholarly self-awareness, in order to provide an accurate and comprehensive account of their engagement with the census. The observational aspect played an important role in both the proposal and in the essay that students prepared in Weeks 4 to 6. How the students collected data had an effect on the data available

²⁷ S4, Proposal.

²⁸ S5, Proposal.

and consequently on their findings. Thus, students had to be able to articulate their process and analyze it for meaning and potential exclusions. In the submitted project proposals, only half the students discussed their investigative process in a specific fashion that indicated they had either already begun the *DECIMA Project* investigation or had developed a step-by-step plan that was ready to be implemented. However, in the final projects three-quarters of the students included some discussion of *DECIMA Project* process, thus suggesting an increasing awareness of how an investigation could be influenced by the method of data collection. Happily, the inclusion of a process discussion is evidence of students working at the highest level of the cognitive spectrum by designing, critiquing, and deconstructing their procedures. A large literature has developed around the concept and practice of student self-reflection, exploring both its value and complexity. In the discipline of history, metacognitive reflection has been shown to aid students in the entrenchment of new thinking skills, as the acts of recollecting their process, justifying its steps, and evaluating its proficiency, enables students to become more aware of their cognitive procedures and their relative strengths in the new skill.²⁹ As is common, most students set their investigations alongside the research that they had read, revealing its influence, but also at times reverse-engineering data collection processes, and engaging with other scholars' procedures to elaborate the conversations that they had watched develop.³⁰

29 Beyer, "What Research Tells Us," 226; Elizabeth Belanger, "How Now? Historical Thinking, Reflective Teaching, and the Next Generation of History Teachers," *Journal of American History* 97, no. 4 (March 2011): 1079-1088; Naomi Silver, "Reflective Pedagogies and the Metacognitive Turn in College Teaching," in *Using Reflection and Metacognition to Improve Student Learning*, eds. Matthew Kaplan, Naomi Silver, Danielle LaVaque-Manty, Deborah Meizlish (Sterling, VA: Stylus Publishing, 2013), 1-17; Robert Grossman, "Structures for Facilitating Student Reflection," *College Teaching* 57, no. 1 (Winter 2009): 15-22.

30 One of the initial purposes of the *DECIMA Project* was to facilitate an

To students' surprise, this classroom work brought them into contact with "the real Florentines," like the prostitute Orsolina who opened this article. As Oakley and McDougall have argued, using primary data provides the large-scale "reality and authenticity" that many students crave.³¹ While census work and mapping initially appeared separated from the crowded streets by the process of bureaucratic documentation, pouring over a householder's statement of age, profession, dependents, rent, and property valuation was a far more intimate process. Setting individuals side by side on streets, or above and below each other in sub-divided buildings, conveyed a greater understanding of space as a lived experience. Students questioned relationships between household members, employment roles, sleeping arrangements, and noise levels in an effort to visualize the information before them. Perhaps most importantly, this exercise allowed the class to see how their knowledge of the early modern period had prepared them to question and draw conclusions from documents that revealed the basic foundation of early modern society. Tying this project to their work with previous primary source readings, one student noted:

[t]he valuation of able-bodied men of a certain age over all other Tuscan residents is practically universal among all the

investigation into whether Florentine laws governing prostitutes' restriction of residency (within a certain distance of churches and convents) were observed. To this end, one of the map layers that researchers can access shows the streets on which prostitutes were allowed to reside and ply their trade. Both prostitutes and clergy played an important role as examples of alternative lifestyles in this course, and more than half the class proposed projects in conversation with the readings by Terpstra (prostitutes) and Strocchia and Rombough (nuns); "Women behind Walls: tracking nuns and socio-spatial networks in sixteenth-century Florence" and "Locating the sex trade in the early modern city: space, sense, and regulation in sixteenth-century Florence," in *Mapping Space, Sense, and Movement in Florence*, 87-106 and 107-124.

31 Oakley and McDougall, "Census data as educational resources," 91.

societies we've discussed in class so far. The devaluation of women, and especially before marriageable and childbirth age, has also been a common theme across this semester.³²

This student's ability to chart the continuation of complementary themes across varied times, places, and evidence, points to his/her ability to think relationally (*i.e.*, the valuation of men and the devaluation of women).

The DECIMA Project and Student Development of Cognitive Processes that Promote Reflection

As Peter Seixas has repeatedly advocated, "clearly articulated learning goals are essential for developing assessments that capture and promote these valued learning outcomes and communicate to students the kinds of learning they should be focusing on."³³ In order to illuminate both the investigative path and the instructor's assessment path, students received assignment instructions, a weekly schedule, and the final project's objectives. The last file was provided to students in Week 4 so that over the following weeks they could develop a discussion of their investigative process and findings that reflected the assignment's stated learning goals.³⁴ It was imperative that all three of these files aligned in their expectations so that students could see how the instructions articulated an activity that progressed across a specific timeline, developing ideas and skills that, ultimately, would be measured via the assessment competencies.³⁵

Beyond demanding a more conscious introduction to its

32 S3, *Tuscans and their Families* Synopsis and Reflection Paper.

33 Kadriye Ercikan and Peter Seixas, "Assessment of Higher Order Thinking: The Case of Historical Thinking," in *Assessment of Higher Order Thinking Skills*, eds. Gregory Schraw and Daniel H. Robinson (Charlotte, NC: Information Age Publishing, 2011), 246.

34 See Appendices 1 and 2 for the Weekly Schedule and the Assessment Criteria.

35 Ercikan and Seixas, "Assessment of Higher Order Thinking," 252.

materials and methods, as a course capstone, this assignment differed from earlier course work in that the expected analysis was far less contained. Most students were relatively new to the premodern world, and so typical assignments presented a single primary source and asked a single question.³⁶ Written work focused on understanding the norms of early modern European society and whether students could identify those norms in different media (texts *versus* images).³⁷ This allowed the instructor to evaluate student progress from point A to point B, usually in order to assess simple analytical and argument building skills, as well as basic subject-matter knowledge. A more challenging version of that assignment required students to contextualize their analysis of a single primary source with secondary source research.³⁸ While this added a measure of complexity in analysis and argument, it remained bounded both in path and process. Students worked within a previously conceived discussion to build subject-matter knowledge and reveal skill-level. The assignment's purpose remained the same: to get from point A to point B by travelling along a preset path. In cognitive

36 In this course the first assignment assesses students' ability to identify one of several themes (e.g., behavioral models, public *versus* private spheres, education and household responsibilities) and compare its presence across the two fourteenth-century didactic poems: *How the good wife taught her daughter* and *How the wise man taught his son*.

37 These early assignments focused on the first, second, and third stages of learning: initial understanding, task fluency, and process fluency; Ruth Powley, "Meaningful, Manageable Assessment," *Love Learning Ideas: Ideas, Strategies, Resources for the Busy Teacher* (March 11, 2015), <http://www.lovelearningideas.com/blog-archive/2015/3/11/meaningful-manageable-assessment>.

38 In this course the second assignment assesses students' ability to "read" social messages in images; for example: appropriate marriage partners in Lucas Cranach's *Old and Young* (c.1520), female outsider stereotypes in Hans Baldung Grien's *The Witches* (1510), and concerns related to "dying well" in the anonymous woodcut *The Art of Dying* (1465). Students then contextualize these messages with their own secondary source research to craft a larger argument about society.

terms, using the revised version of Bloom's Taxonomy, these two assignments required students to Understand ("Construct meaning from instructional messages") and Analyze ("Carry out or use a procedure in a given situation"), using some higher-level thinking, but always remaining within the Factual stratum of the Knowledge Dimension.

In contrast, working with the *DECIMA Project* was a more open-ended experience. While the limits of the census appear to constrain student investigation, in fact, the city is open to student interests. Unlike previous assignments that offered preset questions, students were tasked with developing their own investigation. The readings from Terpstra and Rose's volume acted as models and prepared students to think *with* census records, rather than just learn about the city of Florence. Each chapter offered students another opportunity to see how historians posed a question, fashioned an investigative method, drew conclusions from the resulting data set, and integrated the conclusion into a larger societal understanding. Successful projects required students to participate in deep learning practices, interweaving the activity with earlier classroom discussions, and moving through a series of internal rhetorical questions: "What do I know about this subject? How does this information relate to what I already know? What is the broader implication or significance of what I've learned?"³⁹ Not only did these prompts guide students as they considered their own topical interests and the information available through the *DECIMA Project*, but they articulate the basic purpose of the synopsis and reflection papers.⁴⁰ Reflecting this encouragement, in their written work students frequently

39 Tracy Wilson Smith and Susan A. Colby, "Teaching for Deep Learning," *The Clearing House: A Journal of Educational Strategies, Issues and Ideas* 80, no. 5 (May-June 2007): 207.

40 The basic goal of synopsis and reflection papers was to have students reflect on what they know, what they are doing, and use the understanding born of reflection to help them chart a path towards investigating the unknown (*i.e.*, answering new questions).

included phrases that made connections between class discussions and secondary source readings, indicating the project's success at creating socially relevant knowledge that students consciously drew upon. Considering the Terpstra and Rose readings, one student wrote: "This reminded me about the discussion we had in class about the 'Godly City.'"⁴¹ Other students made similar references in both reflection papers and their final projects.

While students' questions had to fit the sixteenth-century urban environment and be answerable by the census dataset and visualization, there were no other restrictions on how they proceeded. Thus, the investigative process—reflecting a student's own cognitive ability and tendency—was a central aspect of this assignment. The proposals due in Week 3 tracked student progress across the project's stages (listed below) and reflect higher order thinking patterns:

- Learn to use the *DECIMA Project*.⁴²
- Develop an appropriate question.⁴³
- Design and observe the data collection method.
- Analyze the data, which involves seeing the patterns present in the responses and the spatial arrangement.
- Contextualize both the question and the resulting patterns amid the conclusions drawn by other historians.
- Formulate conclusions about the patterns' meaning, either

41 S4, *Mapping Space* Synopsis and Reflection Paper.

42 Although in many cases this stage was the source of greatest anxiety, as one student wrote in their final project: "[a]fter all of the information from the DECIMA GIS was gathered, it was easy to analyze and draw conclusions from research. The process of finding the information that has been laid out was simpler than one would think" (S7, Final Project).

43 At first students tended to ask several questions, reflecting uncertainty about the project design process. Through comments on the proposals and one-on-one consultations with the instructor, students eventually narrowed down their interests and developed a sharper sense of what was possible to know via the census data.

supporting or undermining what was found in other places or periods, or through other means of investigation.

- Construct an essay that reflected on the process and contextualized the research findings.

Subject-matter knowledge was checked and reinforced by requiring students to submit an annotated bibliography of related secondary sources as part of their proposal. All but one student identified and discussed knowledgeably the requisite six secondary sources (beyond the assigned readings) in their proposal. This also provided an opportunity for the instructor to guide students towards less accessible, but equally useful, secondary sources.

Project proposals also facilitated the identification of challenging cognitive processes and procedural linkages that appeared invisible to students. The most demanding transition within this process involved students articulating how they expected to see known social trends in the *DECIMA Project's* data. Proposals highlighted this challenge, more often by what students did not discuss. The paragraph of questions signaling subject interest generally preceded a paragraph stating previous knowledge gleaned from class related to that subject. For example, after questioning, "What did it mean to be a prostitute?" one student wrote that "prostitutes were outsiders," and thus evidence of that outsider status should appear in the *DECIMA Project*. This simplistic assertion ignored the character and constraints of the dataset. As prostitute-led households were encoded like any other professional household, this student became disoriented. Classroom discussions about historical lenses helped students understand that "outsider status" could be economic: Most prostitutes lived in cheap rental accommodation. Or "outsider status" could be spatial: Licensed prostitutes were forced to live in designated areas away from convents and churches. Or "outsider status" could appear as a gendered community: female household

heads rather than a nuclear family identified as a husband, wife, and children. While students recognized these behavioral indicators, they were slow to translate their broader cultural knowledge of early modern urban life into the more limited language of the *DECIMA Project's* census returns. After reflection and experimentation, this student's final project was guided by sharper questions showing a deeper understanding of the data's uses and boundaries, and precise evidence-based conclusions: "Prostitutes can be seen on the outskirts of the different quarters in the city to restrict their interaction with other members in society. These prostitutes are in fairly close proximity to the taverns of the city in another attempt to control the areas that sin is spreading in their city."⁴⁴ These sentences reveal that this student successfully integrated results from the *DECIMA Project's* data with a larger social understanding built through earlier classroom discussions.

In this capstone assignment, students engaged with categories at the foundational level of the cognitive spectrum in order to enhance their ability to pursue tasks consistent with actions at the highest level of the cognitive spectrum that met the project's goals. The processes organized under the revised version of Bloom's taxonomic categories—Creating (hypothesizing, designing, and constructing), Evaluating (checking and critiquing), and Analyzing (differentiating, organizing, and deconstructing)—were integral to these early project design and development stages. Moreover, students used second-level categories—Applying (executing and implementing) and Understanding (interpreting, classifying, and explaining)—when they collected census data, identified patterns, and revealed connections with other primary sources and secondary studies. Together these stages combined much of the cognitive spectrum and required students to spend a great deal of time thinking, not only about the households

44 S8, Final Project.

recorded in the census data, but what they could *do with them*.⁴⁵

Research on working memory has shown that daily review improves students' ability to recall concepts and skills learned previously, which become necessary for subsequent learning. Without frequent review of previous learning, students find it harder to master new material.⁴⁶ Thus, this assignment was designed as a series of overlapping phases that allowed review of earlier discussions (Weeks 1-2), collective investigation of census documents and the *DECIMA Project* (Weeks 1-4), independent consolidation of learning through proposal drafting (Week 3), and a final extended flexible work period (Weeks 4-6). In this last phase, students could work through the data collection, analysis, or essay construction, either on their own or in the classroom and ask questions of the instructor or other students. In each class during the assignment period, students practiced using the *DECIMA Project* platform and grappled with the census format: reviewing the foundational capacities that underpinned their investigations. Moreover, doing this together as a class allowed students to benefit from each other's technical advice and discoveries and immediately build on suggestions.⁴⁷

While at the start some students were anxious about using the *DECIMA Project* website, these practical challenges lessened with

45 Several students used the *DECIMA Project*'s data on property values to draw conclusions about the socio-economic character of a variety of neighborhoods in city, and reinforced those conclusions by exploring the professions associated with those local households. This active process reinforces Willingham's reminder that "memory is the residue of thought," and so time spent considering the applicability of ideas to data is likely to entrench understanding in students' minds; Willingham, *Why Don't Students Like School?*, 47.

46 Barak Rosenshine, "Principles of Instruction: Research-Based Strategies That All Teachers Should Know," 36, no. 1 *American Educator* (Spring 2012): 13 <https://files.eric.ed.gov/fulltext/EJ971753.pdf>; Willingham, *Why Don't Students Like School?*, 42-47.

47 Most students chose to work in the classroom, even when attendance was optional.

frequent use of and familiarity with the website and sharing their successes with fellow students. Later students expressed anxiety about what they could not know. Proposals, which were returned with substantial feedback, solved this issue by guiding students towards more specific paths and achievable goals. For example, one very broad proposal asked: “What was the relationship between a painter in 1500’s Florence to the rest of society?” While this student had a clear sense of how to use the *DECIMA Project* to assemble information about specific households led by artists, they could not translate that data into a comprehensive understanding of the profession in this time and place. Following in-class discussions connecting the census inquiries to broader social experience, in their final project the same student wrote far more precisely:

The conclusions that can be drawn from this information are obvious. [...] there were more than likely more men in the occupation overall. Most tended to stay in the same quarter of S. Spirito, which means they could have been a small intimate community of painters. A few worked in their homes, while others worked in the workshops. Most lived on the same street and very close to each other, while a few lived further out. Most also belonged to the same parish, meaning they were part of the same religious community.⁴⁸

Generally, identifying the project’s parameters (albeit provisional and topical) helped to allay anxiety by reducing the scope of possible research and initiating contact with the instructor who reassured them that they could answer certain questions successfully. Moreover, the process itself offered a space in which to confront fears, ask questions, and explore possibilities. One student confided that

48 S7, Proposal and Final Project.

[o]verall, the process of finding sources [data] took several hours, and I had to change my criteria several times. I think this process actually helped me, because it made me think outside the box and made me realize the different aspects and people that worked.⁴⁹

Finally, working on individual projects in the classroom offered students the opportunity to collaboratively problem-solve, consult the instructor, and reconfigure ideas as they developed, taking advantage of a more individually responsive learning environment.

Application in Other Historical Contexts

American History classes can develop similar projects using materials made available by the United States National Archives and the United States Census Bureau. Since 1790 the United States has conducted decennial censuses, which are made fully available to the public following a seventy-two year time lag. Currently, the National Archives allows free online access to the 1940 Census and offers access to earlier census documents through Ancestry.com and FamilySearch.com.⁵⁰ Through the 1940 Census students can access pages from enumerator logs across the country that present household information similar to the *DECIMA Project*: name, age, sex, race, marital status, household head/members, educational attainment, owner/renter status, and salary. In addition, the Census Bureau offers a Census Data Mapper tool that allows customized maps of Population and Race, Age and Sex, and Family and Housing, using the 2010 survey data. These maps visualize data down to the county level providing students with resources to develop questions about national character or

49 S2, Proposal.

50 “1940 Census,” *National Archives*, <https://1940census.archives.gov/index.asp>. Fees may apply to using Ancestry.com and FamilySearch.com, and many public libraries carry subscriptions to these sites for their patrons.

regional comparisons and apply important historical lenses.⁵¹ Early American and world history classes might consider the *Trans-Atlantic Slave Trade Database*, which presents details of 36,000 slave ship voyages from the late sixteenth century to the mid-nineteenth centuries.⁵² Although this is not a census, it offers a similar large-scale dataset with a variety of variables to influence inquiries. Not only does the database provide names of 91,491 captives, but it allows the detailed exploration of the volume and geography of the slave trade, commercial and personal links between ports, and the outcomes of voyages interrupted at sea. Like the *DECIMA Project*, the *Trans-Atlantic Slave Trade Database* facilitates student interest and agency at all stages of the investigative process and encourages higher order thinking.

World history classes could also look to the United Nations' Statistics Division, which offers open-access datasets online from 1995 to the present. These data tables originated in the Demographic Yearbook census questionnaires that explore basic population characteristics, educational attainment, ethnocultural identity, migration history, and household and economic information.⁵³ Although neither the United Nations nor the *Trans-Atlantic Slave Trade Database* sites have their own mapping tools, this is a good opportunity for students to experiment with basic, easy to use mapping resources like GoogleMaps and StoryMaps by Esri. Both these databases offer students the opportunity to

51 Students can also display data tables compiled by the Census Bureau and export these to Excel in order to pursue variant questions. "Census Data Mapper," *United States Census Bureau*, accessed March 9, 2019, <https://www.census.gov/geo/maps-data/maps/datamapper.html>.

52 *Voyages: The Trans-Atlantic Slave Trade Database* (Slave Voyages v2.0.3), Emory University, <https://www.slavevoyages.org>. This site includes introductory essays on a variety of topics, static maps, and lesson plans. See also the companion volume, David Eltis and David Richardson, *Atlas of the Trans-Atlantic Slave Trade* (New Haven, CT: Yale University Press, 2010).

53 "Demographic and Social Statistics," *United Nations Statistics Division*, accessed March 9, 2019, <https://unstats.un.org/unsd/demographic-social/products/dyb/dybcensusdata.cshtml>.

consider a large amount of data, think alongside the data streams, and reflect on their chosen investigative path. As this article has argued, moving from posing a question to testing a data process and on to developing a visualization strategy challenges students to think in a more complex and relational fashion about important issues, change over time, evidence-based conclusions, and how to most cogently present investigative results.⁵⁴

Conclusion

In conversation with the instructor, students readily admitted that this was the most challenging of the course assignments, claiming that they were not good data analysts. One student wrote that “[t]his was definitely the hardest paper I’ve ever written in my life, because data work is not one of my strongest points.”⁵⁵ More likely they sensed the difference between the two types of course assignments in terms of complexity and novelty. As Barak Rosenshine advocates, early assignments must show the mastery of foundational knowledge before moving on to experiential, hands-on activities.⁵⁶ Using the *DECIMA Project* required a mastery of the underlying principles of early modern society, in effect, deep learning: “To see the deep structure, you must understand how all parts of the problem relate to one another.”⁵⁷ While students did not comment on the fact that they had far more latitude in terms of their investigation’s focus and

54 On the integration of GIS-based projects in social studies and university classrooms, see Jung Eun Hong and Ashley Melville, “Training Social Studies Teachers to Develop Inquiry-Based GIS Lessons,” *Journal of Geography* 117, no. 6 (2018): 229-244; Kurt Schlichting, “Historical GIS: New Ways of Doing History,” *Historical Methods: A Journal of Quantitative and Interdisciplinary History* 41, no. 4 (2008): 191-196.

55 S6, emailed message to the instructor.

56 Rosenshine, “Principles of Instruction,” 12.

57 Powley identifies this “deep learning” as characteristic of fourth stage learning; Powley, “Meaningful, Manageable Assessment”; Willingham, *Why Don’t Students Like School?*, 100.

path, quite a few students took inspiration from the Terpstra and Rose collection and developed projects that focused on prostitutes, nuns, or female workers. As expected, these readings provided models for understanding the *DECIMA Project*, while helping students articulate what they wanted to know, and how they could work within the census data's limits.

In their introduction to *The Practice of University History Teaching*, Alan Booth and Paul Hyland's motivating question is: How can we "help students become high-level learners in a way which will prepare them to be critical, creative, independent, and reflexive"?⁵⁸ As this study argues, census data allows students to integrate demographic trends with subject matter knowledge, and ultimately show how this knowledge of the past is part of a larger discussion of historical significance.⁵⁹ Students who construct open-ended historical investigations using the *DECIMA Project* draw on central disciplinary concepts: articulating a question, constructing an argument, evaluating sources, and discerning challenges to the narrative.⁶⁰ This assignment allows instructors to determine if "students retain important information, understand topics deeply, and actively use the knowledge they gain," in effect evaluating the depth of the larger learning process.⁶¹ As this article has shown through students' own reflective writing, the class developed an awareness of how their own ideas had evolved and how their work stood in relation to the published studies that

58 The *DECIMA* assignment that this study describes embodies most of the "Characteristics of high-level learning in history" articulated by Booth and Hyland. Alan Booth and Paul Hyland, "Introduction: developing scholarship in history teaching," in *The Practice of University History Teaching*, eds. Alan Booth and Paul Hyland (Manchester: Manchester University Press, 2000), 5, 6-8.

59 Wineburg, "Beyond 'Breadth and Depth,'" 257.

60 Paul Hyland, "Learning from feedback on assessment," in *The Practice of University History Teaching*, 234; Wineburg, "Beyond 'Breadth and Depth,'" 260.

61 Michael F. Graves and Patricia G. Avery, "Scaffolding Students' Reading of History," *The Social Studies* 88, no. 3 (1997): 135.

they read. In sum, mapped census data presented via an open-access portal like the *DECIMA Project* provide students with an opportunity to build historical understanding by engaging in assessments that compel them to reflect on their historical thinking.

Appendix 1: DECIMA Project Assignment Schedule

WEEK 1: Census Documents: Evidence, Opportunities, and Limitations

- Introduction to the Florentine *Catasto* of 1427.
- Students submit a synopsis and reflection on the assigned chapters by email before class.
- 1. Herlihy & Klapisch-Zuber, *Tuscans and Their Families*, Chapters 1, 4, 5, 10.

WEEK 2: Using Census Documents to Investigate the Past

- Introduction to the *Decima* of 1561-62 and the *DECIMA Project*.
- Students submit a synopsis and reflection on the assigned chapters by email before class.
- 1. Terpstra, “Introduction” and Rose “Thinking and using DECIMA: neighborhoods and occupations in Renaissance Florence” in *Mapping Space, Sense and Movement in Florence*.
- 2. A chapter of your choice from *Mapping Space*: Faibisoff (surveying and collecting), Jamison (institutions as landlords), Strocchia/Rombough (nuns), or Terpstra (prostitutes).
- Please bring laptops/tablets/smart phones to class this week!

WEEK 3: Develop a Project Proposal

- Open class period in which students will develop a proposal (1 full page single-spaced) and an annotated bibliography (1-2 full pages single-spaced) that includes 6 secondary sources (beyond *Tuscans and Their Families* and *Mapping...*). The bibliography should include monographs/scholarly books or journal articles/chapters published after 1975. For each source provide the full Chicago Manual of Style bibliographic citation and a four-sentence explanation of the work’s thesis, source base, and specific ways in which it will support your investigation.
- Proposal and annotated bibliography are due by email on Monday of Week 4.
- Please bring laptops/tablets/smart phones to class this week!

WEEK 4: Design a Process, Collect and Analyze Data

- Students receive feedback on their proposals and have the opportunity to discuss them with the instructor. Students also

receive and discuss the assessment criteria with the instructor.

- Open classes in which students work with the *DECIMA Project* to build a data argument. Be prepared to discuss what you are doing and what you have found in the data.
- Please bring laptops/tablets/smart phones to class this week!

WEEK 5: Contextualize Findings and Construct Essay

- Students should begin to write their papers independently. The instructor is available in the classroom for consultation and will read a full essay draft if it is finished and sent via email – optional.

WEEK 6: Complete and Submit Essay

- Students should write their papers independently. The instructor is available in the classroom for consultation.
- Essay is due at the end of the week.

Appendix 2: DECIMA Project Assignment Criteria

<i>Competency</i>
<i>Research and Contextualization</i>
Assignment chiefly analyses a specific group/issue using data drawn from the DECIMA Project
Investigation is a new contribution to the scholarly discussion
Assignment contextualizes the group/issue using published secondary source research
Adequate citations for quotations/ideas and DECIMA material
Essay demonstrates intelligent reflection on subject and sources
<i>Process and Discussion</i>
Analytic rather than narrative discussion: argues a thesis/ draws a conclusion rather than simply tells a story
Essay has an introductory paragraph which: <ul style="list-style-type: none"> • introduces the DECIMA project • identifies the subject group/issue of the paper
Essay has a logical development of discussion which: <ul style="list-style-type: none"> • explains how the data was obtained • explores meaning of and conclusions drawn from the data
Clear sense of historical causality in data discussion: <ul style="list-style-type: none"> • includes dates, names, details, especially for DECIMA entries or institutions
Clear sense of historical consistency + context in analysis: <ul style="list-style-type: none"> • considers date, place, gender, class, trade as appropriate
Student reflects meaningfully on project design and process.
Formal conclusion reviews investigation and central argument.
Footnotes used for quotations and borrowed information. All primary sources appear in the footnotes and bibliography.
All footnotes + bibliography use the appropriate Chicago Manual of Style format.