Introducing Digital Humanities in the Undergraduate Classroom: Strategies, Solutions, and Pedagogical Practices Using the Gale Digital Scholar Lab

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Abstract: *This paper explores the practical aspects of teaching digital humanities skills to undergraduate students primarily from humanities and social science backgrounds. The results are presented in the form of a case study of a course titled Introduction to Digital Humanities taught at the University of Washington between 2015 and 2018. While many students who took the course had little to no previous experience in the field, the majority chose the course in order to become technologically proficient and remain competitive in the job market after graduation. The case study explores the lessons learned during the first three course sessions, and describes the strategies implemented during the fourth session to address many of these instructional and classroom management challenges. These strategies included the use of a cloud-based digital tool—the Gale Digital Scholar Lab—to create and manage corpora of primary source material related to the class research topic. Students worked to clean up OCR text in the platform, before using the integrated digital tools to conduct quantitative and qualitative text analysis. These analyses included topic modeling, n-grams, named entity recognition, and sentiment analysis. Students exported their results either as raw data (CSV/JSON) to explore further using external tools including Google Fusion Tables and Voyant, or as image files to include in their final Omeka exhibits.*

Keywords: digital pedagogy ■ undergraduate ■ digital tools ■ text mining ■ digital humanities ■ cloud-based digital humanities tools

The evolving field of digital humanities offers an opportunity for students to develop technical proficiency in the context of humanities content. The field has become known for core values that include openness, collaboration, diversity, experimentation, collegiality, and connectedness, an ethos that extends into the classroom environment and teaching practices (Spiro 2012). Digital humanities is not a subdiscipline of humanities; it doesn't belong under the roof of any one department. Its scope and potential are limited only by the imagination of those involved in it. The nature of digital humanities is collaborative—much work is project-based, with the ultimate goal of making content or research available in a digital format, generally online. This content could be a collection of primary and/or secondary sources, a database, or perhaps a geographical mapping site. Planning and developing a successful digital project involves effective project management and teamwork; consideration of best practices for project preservation and sustainability;

and development and implementation of topics as diverse as text modeling, working with images, maps, and statistics—all the while considering the aesthetics of online presentation and design. It is experiential education and technological training combined with traditional liberal arts skills. Digital humanities training and hands-on experience are attractive to many students because the skills learned are readily transferable to industry and beyond.

How best to bring the digital tools and practical skills we use as researchers into an undergraduate classroom? This paper will discuss strategies for introducing digital humanities to a diverse group of students from various university departments and with a wide range of skill sets. The experience is described from the viewpoint of a faculty member who is first and foremost a scholar in the humanities using digital tools to investigate historical research data, as opposed to a faculty member whose discipline is primarily technology focused.

CASE STUDY: INTRODUCTION TO DIGITAL HUMANITIES

Introduction to Digital Humanities was a course taught at the University of Washington between 2015 and 2018 to four separate cohorts of students. The three-to-five credit class had no prerequisites, and met semiweekly for two hours each session.

The initial three course sessions were very similar in nature, comprising mixed undergraduate and graduate groups from multiple departments working in vertically aligned teams, with the graduate students acting as project leads in their respective groups. The syllabus (see figure 1) was broad-based and wide-ranging, guiding students through the process of planning and building a digital exhibit based on a particular research question. In the first two sessions, this question was chosen by the lecturer based on her familiarity with the data—Middle Eastern travel journals—and her relative unfamiliarity with teaching digital humanities. By the third course session, students were able to choose their dataset from several options. The thematic flow of the class mirrored that of a successful digital humanities project, starting with developing team norms and work plans, identifying and implementing best practices for collecting and curating data, analyzing and visualizing the collected material, and finally building a digital exhibit to showcase the products of each student team's work.

The broad learning goals of the class included:

1. fostering core computing competencies for humanities and social science students;
2. promoting interdisciplinarity and collaboration;
3. using digital tools to investigate humanities data;
4. bringing a digital project through a complete lifecycle including planning, implementing, and then concluding, with an emphasis on building for sustainability; and
5. exposing students to a range of projects, digital tools, and research methodologies falling under the umbrella of digital humanities.

Unsurprisingly, these first three times the course was offered it presented a number of pedagogical and practical challenges (not least because they were somewhat experimental in nature), and naturally evolved and improved each time. By course number four, in Autumn 2018, all the solutions to the challenges described below were implemented in the classroom, and the experience became more manageable for the instructor and more streamlined for the students.

CHALLENGES PART I: CLASSROOM

- Initial promotion of the course was difficult, listed as it was in the Near Eastern Languages and Civilization (NELC) course catalogue, since students don't generally go looking for a digital humanities course in a NELC department. In an effort to boost enrollment numbers, the lecturer did a fair amount of promotion around campus, including making posters, pitching the course to a variety of student groups and classes, and posting to various social media channels.

FALL QUARTER 2018 SYLLABUS - INFO 498 C: AN INTRODUCTION TO DIGITAL HUMANITIES	
TOPIC	**THEME**
PLANNING	Welcome! Syllabus Review
	What is a Digital Project? Evaluating Digital Projects
	Copyright & Open Source Material
	Final Presentation Planning & Omeka Overview
	Digital Scholar Lab: Intro & Demo
	LAB: Project Planning and Collaborative Working
	Risk Assessment & Data Management Plans
COLLECTING & CURATING	Metadata Lab
	Creating a Digital Archive; What is OCR?
	Corpus Creation & Curation; Cleaning Data with OpenRefine
	Text Cleaning with RegEx, Lexos & Digital Scholar Lab
	Libraries & Digital Scholarship; Text cleaning in Hathi Trust
WORKING WITH DATA	LAB: Cleaning Content Sets
	Text & Corpus Analysis with Voyant & Digital Scholar Lab
	XML & TEI
	Geoparsing with Clavin, Mapping
	LAB WORK
	Named Entity Recognition, Sentiment Analysis & Ngrams
DIGITAL SHOWCASE	LAB WORK
	Final Group Presentations & Digital Showcase

Figure 1: Syllabus for Introduction to Digital Humanities.

- The amount of time available for in-person hands-on work was limited; the University of Washington operates on the quarter system, which is just 10 weeks long, and the digital humanities classes met twice a week for approximately two hours of in-person time each.
- The students were very diverse in terms of skills and background, which presented potential problems in pitching the course at a level which would offer a worthwhile educational experience for all.
- An appropriate setup of the physical classroom space was an important consideration. The traditional university classroom often presupposes a lecture-based, passive learning experience. The nature of digital humanities work is such that this type of environment would not be conducive to positive learning outcomes.
- The lecturer was a subject matter expert first and digital humanist second. It's often the case that humanities faculty are resistant to the notion of introducing a practical element to their classroom, not least because teaching tech to a group of students vs. more traditional humanities topics can present challenges to the subject matter specialist. In this case, the lecturer had spent eight years developing technical skills on her own time as a pathway to

using digital humanities methodologies to investigate her research data. During this time, collaboration with like-minded colleagues led to the development of an undergraduate internship program in digital humanities (at Newbook Digital Texts, a publishing house), and subsequently grant funding to develop and teach the initial three introduction to digital humanities courses. Such a lengthy apprenticeship period is often not viable or practical for faculty who are heavily invested in teaching and research.

CLASSROOM SOLUTIONS

- The Informatics department proved to be a more logical place to list the introductory digital humanities course. Offering both majors and minors in the field, its classes attract students from varied departments, and without promotion or publicity, the intro class filled within a day of being open for registration.
- To maximize the amount of time available for hands-on work with the teacher and TA present, the lecturer opted to switch from spending time giving overview lectures to a flipped classroom setup. (Stommel 2013) The expectation was set that students carry out preliminary preparation before meeting in class. This involved watching introductory videos created for each class session, supplemented by course readings and online participatory discussion boards. In-class sessions began with Q&A based on work already completed, and students came to class ready to put some of the theories they had learned about into practice.
- Students completed a pre-class survey which included questions about previous experience, interests, skills, and goals so that they could be placed in well-balanced teams from day one. They were able to interact with and learn from each other immediately, while also building invaluable social skills. The survey also provided the lecturer with guidance about the level of detail necessary for each class topic, and presented opportunities to promote peer learning and engagement. Students took a second survey mid-way through the course to identify any lingering issues or concerns, as well as to solicit requests for discussion topics. The opportunity to interact with students one-on-one in each class session was invaluable in enabling the lecturer to customize the learning experience.
- The University of Washington has a number of Active Learning Classrooms (ALC) which are ideal for the type of hands-on team-based work which characterizes digital humanities, centered on discussion, one-on-one interactions, and immediate feedback and troubleshooting during in-class activities (Hornby 2017). Practical features include easily movable furniture to create hubs for teams to work in, with easy options to bring the students together in a larger group setting. Each of these hubs had a larger monitor screen at each table for collaborative work, as well as writable wall surfaces for planning and brainstorming activities, and—essentially—multiple appropriately situated electrical outlets. This classroom setup facilitated regular interaction between the teacher, TA, and students, which in turn enabled swift feedback and responses to technical issues or student questions. Students found this non-traditional setup both dynamic and practical, as it enabled them to engage not only in the material they were working with, but also in the learning process more broadly since they had a measure of control over their own experience. The team-based setup also facilitated ready collaboration and the continued development of social skills.
- In recognition of the fact that she was not an expert in every topic to be covered in class, the lecturer framed the introductory course as an opportunity to collaborate with colleagues in the library and in other university departments, in order to offer students a comprehensive and well-rounded syllabus. For instance, a lecturer in the Library and Information Science program covered topics like copyright and working with open source material, and the Metadata Librarian discussed Dublin Core standards and the importance of clear and consistent records as a matter of project sustainability. Faculty from Human Centered Design and Engineering spoke about effective project planning and design as students began the process of building their digital exhibits.

In the Autumn 2018 course, the lecturer was able to collaborate with a commercial vendor, Gale, in a trial first classroom use case of its recently released Gale Digital Scholar Lab.

CHALLENGES PART II: TECHNOLOGY

The first three times the course was taught involved experimentation with many digital tools and platforms, which, in retrospect, presented a somewhat ambitious undertaking and often created rather than solved problems. A selection of these challenges is described below.

- Students showed up with a wide variety of tablets and laptops with diverse operating systems and even system languages. Since the class relied heavily on software that students either downloaded to their local machines or used online, at least one whole session was dedicated to downloads and installs, and troubleshooting continued over the course of the quarter. Under these circumstances, it was often difficult to offer an engaging educational experience.
- The range of analyses that students were conducting in the first three classes necessitated the use of multiple platforms over the course of the quarter. Each platform had its own quirks, and each had a learning curve (sometimes a steep one). It was often the case that workflow was neither clear nor intuitive, and learning how to access and navigate the platforms took significant time. (Christie 2017).
- On a broader scale, use of technology in the course was hampered by institutional limitations, particularly in terms of IT and software support, and dedicated support for digital scholarship.

TECHNOLOGY SOLUTIONS

Collaboration with Gale, and use of the Gale Digital Scholar Lab, enabled student use of a single solution for much of the process of corpus building, data curation, analysis, and visualization. Since the Gale Digital Scholar Lab is cloud-based, the types of computers students brought to class (or not) were no longer an issue. Similarly, by limiting the number of secondary tools students installed and used, this aspect of classroom management became less of a headache and the focus shifted towards developing research questions and ultimately presenting the results in a digital exhibit.

AUTUMN 2018 INTRODUCTION TO DIGITAL HUMANITIES

The remainder of this paper will focus on the specifics of the Autumn 2018 course, discussing the syllabus and the digital tools used by students in class. The demographics of the 2018 course were much broader than earlier iterations, since Information School classes are heavily sought-after by the student population at large (see figure 2). The class filled within hours, with a cohort of 35 students. Twenty-one university departments were represented in class, and while most students were university juniors and seniors (third/fourth year), 90 percent of the group had no previous experience in using digital tools to investigate humanities data—indeed most were confused about what digital humanities represented as a discipline. They joined the class either to develop digital literacy, or to apply existing technical or discipline-specific tools to a humanities dataset.

The broad course learning objectives have been described above, and in order to meet these goals, the lecturer worked to create an environment and class culture that encouraged autodidacticism and peer learning, as well as knowledge-sharing, participation, and collaboration (see also Savonic and Tagliaferri 2017). The lecturer modeled this ethos by inviting guest presenters to share expertise, highlighting the benefits of cross-disciplinary collaboration. Flipping the classroom helped de-emphasize the traditional classroom model of the professor as the authority figure and shift the in-class focus towards building relationships with individual students, while keeping an eye on team dynamics at the same time. Early class sessions focused on

Autumn 2018 Student Demographics

Percent	University Department
24%	Geography
15%	Economics
12%	Informatics
6%	Library & Info Science
6%	English
6%	Mathematics
3%	Philosophy
3%	Environmental Science and Resource Management
3%	Business Administration
3%	Communication
3%	History
3%	Art
3%	French
3%	Business Administration (Finance)
3%	Earth & Space Sciences
3%	Near & Middle Eastern Studies
3%	Political Science
3%	Pre-Architecture
3%	Material Science & Engineering
3%	Psychology
3%	Sociology

Figure 2. Autumn 2018 Student Demographics.

discussing and developing strategies for professionalizing roles within teams, which included establishing and maintaining expectations for working in a team environment, delivering on time, and reporting progress and final outcomes. While each student had a designated role within their team (for example, project manager, content specialist, data wrangler, visualization specialist, etc.), it was important to foster an environment where equal weight was accorded to what might otherwise be labeled as faculty vs. technician roles.

In order to encourage a spirit of inquiry and curiosity, and since students were exploring datasets in topics which were new to them, a goal was to encourage students to experiment without fear of failure. To this end, one of the bedrock assignments was a weekly worklog documenting class notes, reading, and discussions, as well as full step-by-step guides to tools used and analyses run. Provided that students kept a complete record of their work, they were not penalized if they ran an analysis that returned lackluster results, or experimented with a tool that, ultimately, did not work out as expected.

The research theme of the course was historic menus, which was chosen because it was broad yet inclusive enough to engage everyone in the class, with plenty of scope for student teams to personalize their research question. The theme was inspired by New York Public Library's (NYPL) "What's on the Menu" project, and students mostly used content sourced from Gale Primary Source archives as well as some additional material from the NYPL project and

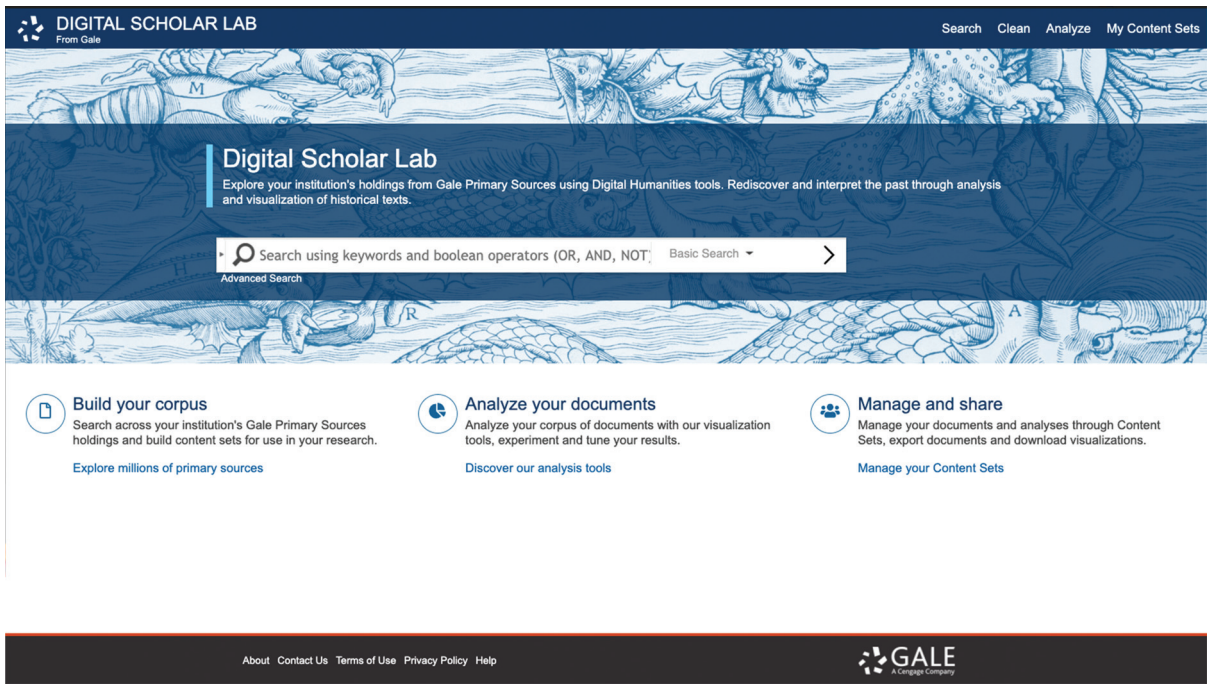

Figure 3. Screenshot of Gale Digital Scholar Lab Landing Page.

other open source repositories. It's often the case that students and faculty may be unaware of the extent and range of digital collections available to them via their library website. A significant benefit of Gale Digital Scholar Lab usage is that it promotes awareness and drives usage of an institution's existing database collections, including Gale Primary Sources, which are readily available to support research, teaching, and digital scholarship.

Over the course of the quarter students learned best practices for planning their projects, creating and curating a dataset, and using digital tools to analyze the material they had collected, before building a digital exhibit to display the results of their work. We used Omeka for display purposes, and Gale Digital Scholar Lab for the process of collaborative dataset creation, curation, and analysis.

The workflow we followed in the course is summarized here on the landing page of the Gale Digital Scholar Lab (see figure 3). Students began by building a corpus of material (described as "content sets" in the Gale Digital Scholar Lab), going through the process of curating it and then cleaning the optical character recognition (OCR) data, before taking their content sets through the various forms of text mining analysis and generating visualizations of analysis results. The importance of workflow and process was highlighted by the lecturer in the form of recorded tutorial videos, by an in-class demo, and by directing students to the contextual Help documentation on each webpage of the Gale Digital Scholar Lab—which, importantly, includes a glossary of digital humanities terms, in recognition of the fact that vocabulary is often the biggest barrier to understanding in a new field.

Each student team had a group Gmail login to facilitate collaboration on the same material without interfering with the work of any of the other teams in the class. When they logged in, students accessed a personalized workbench area that stored the content sets they created and the analyses they ran, along with descriptive metadata about the documents in each content set (see figure 4). Students also had the option to export a variety of information including individual primary source images, OCR text, visualizations, and raw tabular data, which they could then use in external tools or, in the case of the intro class, include in a digital exhibit.

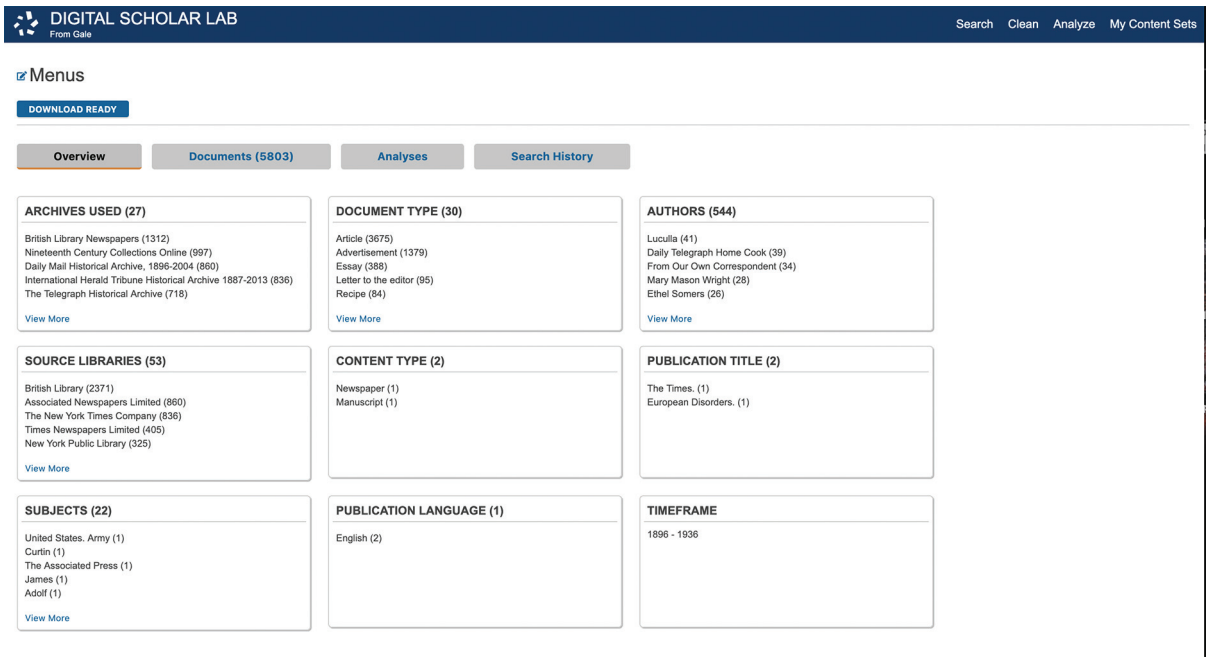

Figure 4. Screenshot of Gale Digital Scholar Lab's My Content Sets.

1. Creating and Curating Content Sets

The starting point for student work was the creation of content sets related to their team topic. Searching for the word "menus" in its broadest sense returned thousands of results, so students worked with Advanced Search filtering to curate their results into manageable content sets. The teams brainstormed menu-related topics of interest and then iterated through the process of searching and curating to hone and develop their research question, and to source sufficient information to analyze.

As students decided which documents were most relevant for research, they used the metadata as a guideline, as well as the snippet of OCR text for each document on the Search Results page. Content sets can contain up to 10,000 documents, which was more than adequate for class purposes.

Data curation takes a long time if it is done well, yet it is an essential building block if analysis results are going to be meaningful. Students were able to navigate into specific documents to take a closer look at a side-by-side view of the relevant original article and its OCR text, to determine its suitability for inclusion (see figure 5).

In going through this process, they used the OCR confidence level that is called out for each document as a guideline for curation, not necessarily discounting material with a low confidence rating because it could have been image heavy, or scanned from a poor quality original or microfiche, or even an older version of the OCR scanning software.

The results of this iterative process of data curation were that each of the seven student teams developed research questions and built a collection of digital objects in the Gale Digital Scholar Lab. There was great diversity in the topics chosen, ranging from "what did vegetarianism mean before World War I?," "evolving attitudes towards Chinese food in the US," and "food patterns in boom and bust," to "the evolution of the Thanksgiving menu since the 1800s," "the history of the famous Terrace Room in the Hotel New Yorker," "the history of eggs Benedict as a breakfast dish," and lastly, "By the Glass"—a project mapping wine on menus to their contextual history.

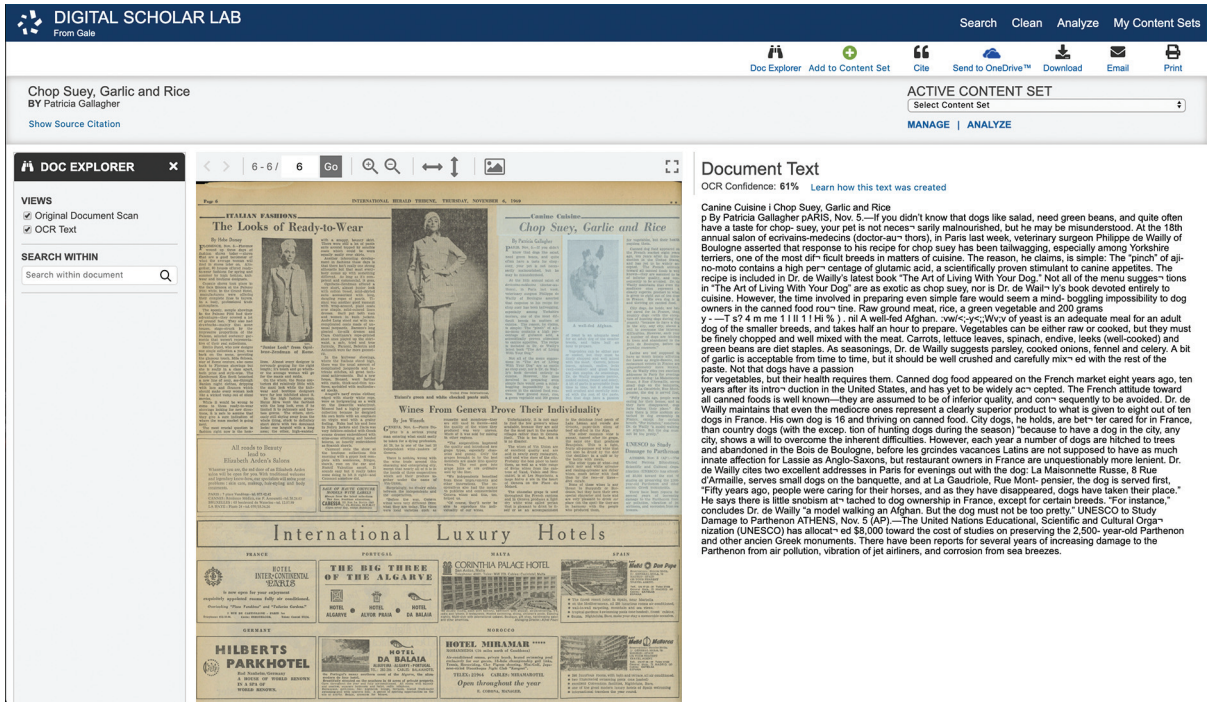

Figure 5. Screenshot of Gale Digital Scholar's Document Explorer.

2. Preparation for Analysis

An important yet often overlooked part of the text mining and analysis process is the cleaning of OCR text. At the time the class started, text cleaning wasn't an inbuilt feature in the Gale Digital Scholar Lab; it was added to the platform in November 2018. Therefore, initially at least, students had to export their OCR texts and clean them outside the Gale Digital Scholar Lab using Lexos and OpenRefine. A number of students experienced some of the familiar download and install challenges and, particularly with OpenRefine, a steep learning curve to get up and running. Once cleaning was introduced to the Gale Digital Scholar Lab, students were able to move immediately from their content sets into the cleaning process in a more streamlined and intuitive fashion.

An important starting point for this type of work is familiarity with the dataset, which enables the researcher to make considered choices about how and what to clean. Students had gained a measure of this insight through the process of careful content set curation. Text cleaning is another slow and iterative process, and in the case of the Gale Digital Scholar Lab, involved downloading a sample set of ten cleaned and ten uncleaned documents for side-by-side comparison, to evaluate the effect that text cleaning choices had on the dataset. Students would inevitably see errors that they had missed, then return to their cleaning configuration to tweak it accordingly. The value of doing this work was underscored by comparing analyses run on uncleaned datasets vs. those that students had taken the time to standardize and clean. Results were invariably more significant and comprehensible in the latter.

3. Analyzing Texts

One of the most useful features of the Gale Digital Scholar Lab is that primary source content and text analysis tools are integrated in a single streamlined work environment. There were six tools for text mining and analysis integrated in the platform, four of which were open source (topic modeling, named entity recognition, parts of speech tagging, and clustering analysis), and two that were custom implementations by Gale (sentiment analysis and n-grams). The Analysis tool

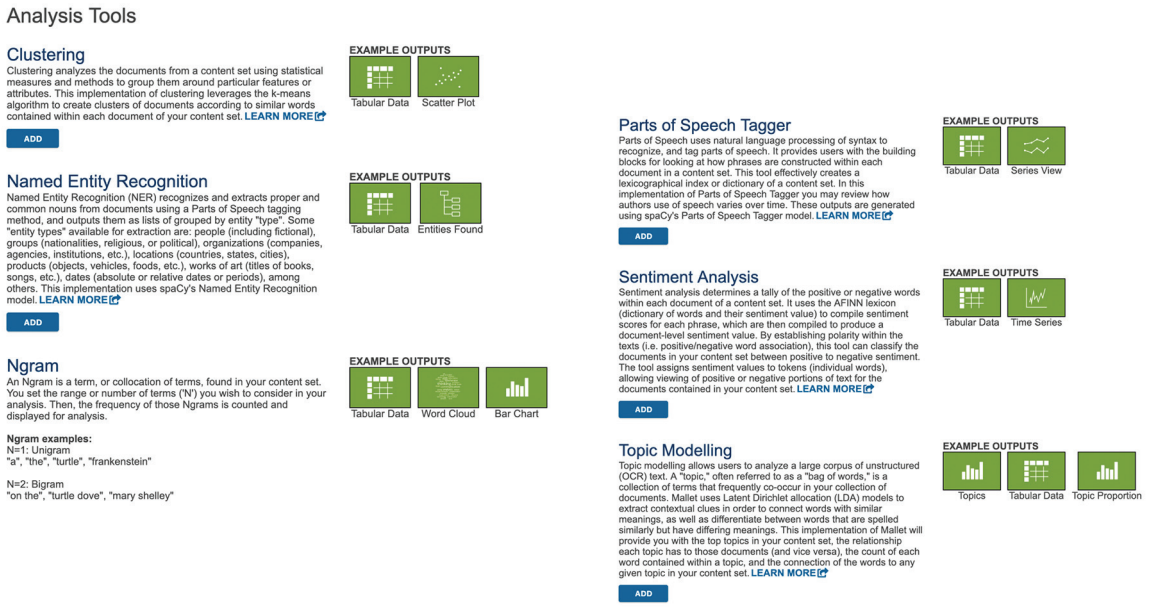

Figure 6. Screenshot of Gale Digital Scholar Lab's Analysis Tools.

page gives a high-level definition of each tool, with links out to developer documentation and algorithms that are important for reproducibility and citation (see figure 6). The platform's Help documentation goes into more detail about the uses and limitations of each tool.

Students focused on four of these tools, largely due to the constraints of time. They began by running a topic modeling analysis to discern if there were themes or topics not immediately visible in their content sets that may merit further investigation. The tool is built on MALLET, which is open source, and widely used by digital humanists. Until recently it was run from the command line, which was out of scope in the context and constraints of the introductory class. In using the topic modeling tool built into the Gale Digital Scholar Lab, students were able to choose the number of topics they wanted the algorithm to return as well as the number of words per topic. In most cases we stuck to the defaults (ten in each case), which returned the most prevalent themes in each team's dataset, many of which were surprising to students and helped shape the direction of further research.

Students ran n-gram analyses to identify the most prevalent words in their datasets, and learned through the process of text cleaning to move beyond the common stop words into more meaningful analysis and visualization. This tool was also a useful starting point for students as they began to explore the material they had gathered; switching between n-grams of various lengths (unigrams, bigrams, trigrams, etc.) enabled them to look at specific words in their broader context.

One of the students noted the significance of the sentiment analysis they ran on their dataset, commenting "Sentiment analysis was by far the most useful because it really captured what happened in 1934. However, we learn that as people got used to the conditions of the Great Depression, they start being more positive again even in the midst of the time period." A few of the conclusions that students were able to draw from their analyses included noting the increasing secularization of material related to Thanksgiving in modern menus vs. those from the nineteenth century; charting the rise of so-called Chinese restaurant syndrome as an extension of anti-Chinese sentiment, as well as tracking the invention of chop suey and the Americanization of Chinese food; and mapping the origins of eggs Benedict as a breakfast staple and its rise in popularity over time.

The final tool students worked with was named entity recognition, which extracts and lists entities such as place names, people's names, organization names, and so on from a given content set. Students used this process as the foundation for mapping their datasets; for example, extracting place names from a Chinese menu dataset related to President Nixon's visit to China in 1972, downloading this information as a CSV or JSON file, and then visualizing the data using Google Fusion Tables.

4. Exporting Data and External Analysis

The Gale Digital Scholar Lab export functionality enabled students to combine datasets created in the platform with those gathered from other sources, and then to analyze all the material using external tools. A CSV download of a topic modeling analysis includes all the data seasoned users of MALLET would expect to see, with the addition of listings for individual Gale document ID numbers.

Some teams also work with material sourced from other open repositories, which they included in their final digital exhibit. Additional external platforms students used were also cloud-based, and included Knightlab's StorymapJS for building project narratives, and Voyant for text mining.

5. Research Results and Digital Exhibits

The final stages of the process involved each team building an Omeka digital exhibit, with the following rubric:

> *Explore creating pages and sub-pages within your Omeka exhibit as a way of displaying the relevant information. Be thoughtful about design, aesthetics, and usability. (Note: the theme you choose will dictate certain layouts, for example, whether the menu is a sidebar or header menu.)*
>
> *1.* ***LANDING/HOME PAGE*** *giving details about your group's project, with appropriate navigation. This should be linked from the main class webpage. Think of a creative title for your work! (e.g., not "Group 1's Project" but "Gastronomy at the Turn of the Century," or something like that).*
>
> *2.* ***ABOUT PAGE***:
> - *Team Members—with a photo and brief bio.*
> - *Each team member should compile their worklogs for the quarter into a single document and store it as a file in Omeka. Link to the file at the end of Team Member bio.*
> - *Completed Project Charter.*
> - *Project One pager.*
> - *Draft Data Management Plan (you don't need to worry about funding issues, but give some consideration to backup and storage).*
>
> *3.* ***A COLLECTION OF ITEMS*** *in Omeka*
>
> *Each person should collect at least five and up to ten items, creating a collection of around twenty to fifty items based on your group size. Each person should have appropriately completed metadata fields for their items, showing consistency across the entire group's collection, and completeness (no empty fields).*
>
> *4.* ***DATA VISUALIZATIONS***
>
> *Include a page that links to at least one detailed data visualization, comprising narrative, analysis, and images from your Omeka collection, which you have worked on collaboratively as a group. (Storymap is an example of a platform that will fulfill these criteria.) Choose from the categories that mirror what we work on in class:*
> - *text analysis (e.g., word frequency analysis, sentiment analysis, topic modeling, theme analysis, etc.)*

- *mapping*
- *data visualization (e.g., network analysis)*

AND include examples (in the form of a link, image, or screenshot) from each of the remaining categories based on your work in class during the hands-on sessions. These might include:

- *word clouds based on the Voyant/N-Grams/Topic Modeling/Text Analysis classes*
- *one or more maps from the Mapping class*
- *term frequency chart or topic modeling sunburst wheel*

The final exhibits and student presentations were impressive, and testament to the students' enthusiasm for their project work and commitment to their team's effort. See figures 7a through 7c for the project home page, the opening screen of one student's exhibit, and an example of a link from that student exhibit's home page.

LEARNING OUTCOMES: MAPPING SKILLS TO JOBS

One class session was dedicated to a discussion of identifying and documenting the transferable skills that students were learning and using, primarily in this digital humanities course but also in their broader undergraduate education. This conversation took place in week seven, once students had had time to work with their teams and make considerable headway in their digital research project. It was prompted largely by lecturer interactions with students during team check-ins each week, when it became apparent that there was general concern about employment prospects particularly for humanities students beyond college. While identifying that all undergraduate students will have learned how to think critically, reason analytically, and communicate effectively, beyond this, the group was able to clearly identify a range of specific skills they were developing and using in class as being relevant and marketable to employers. From data wrangling and management, through project planning and design, these skills also included writing in various formats (for an online audience, for documenting technical decisions, etc.),

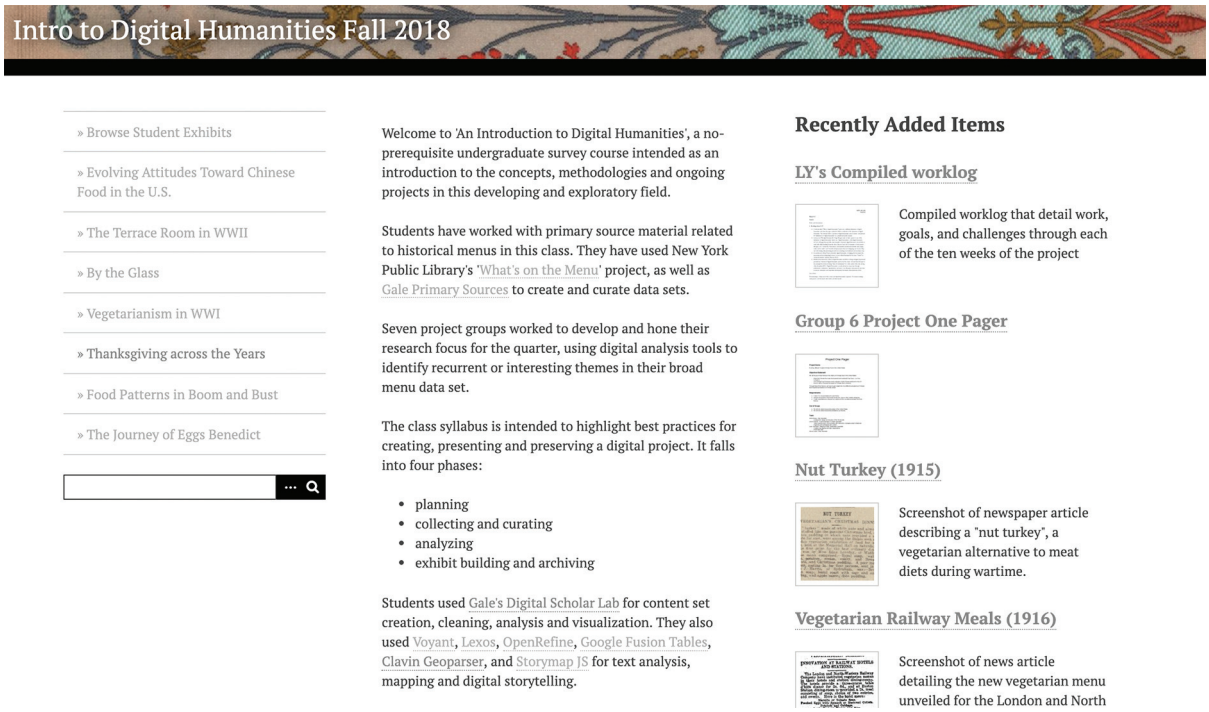

Figure 7a. Home page for the Intro to Digital Humanities Fall 2018 projects.

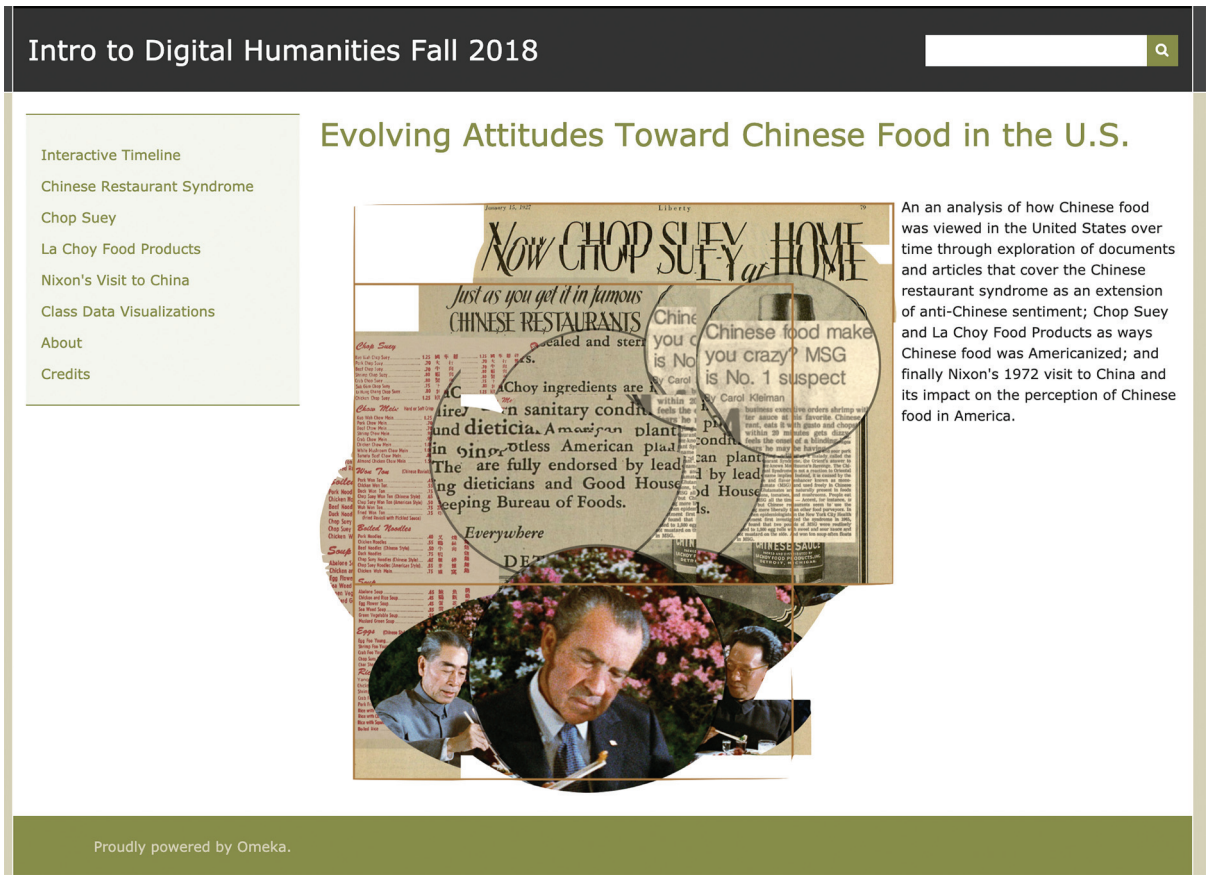

Figure 7b. Student Exhibit: Evolving Attitudes toward Chinese Food in the U.S.

interpreting and explaining data analysis and visualizations, and carrying out research as part of a team, working collaboratively and responsibly. In short, students saw great value in the type of work they were doing in class, and the dots it connected as they transitioned towards life beyond university.

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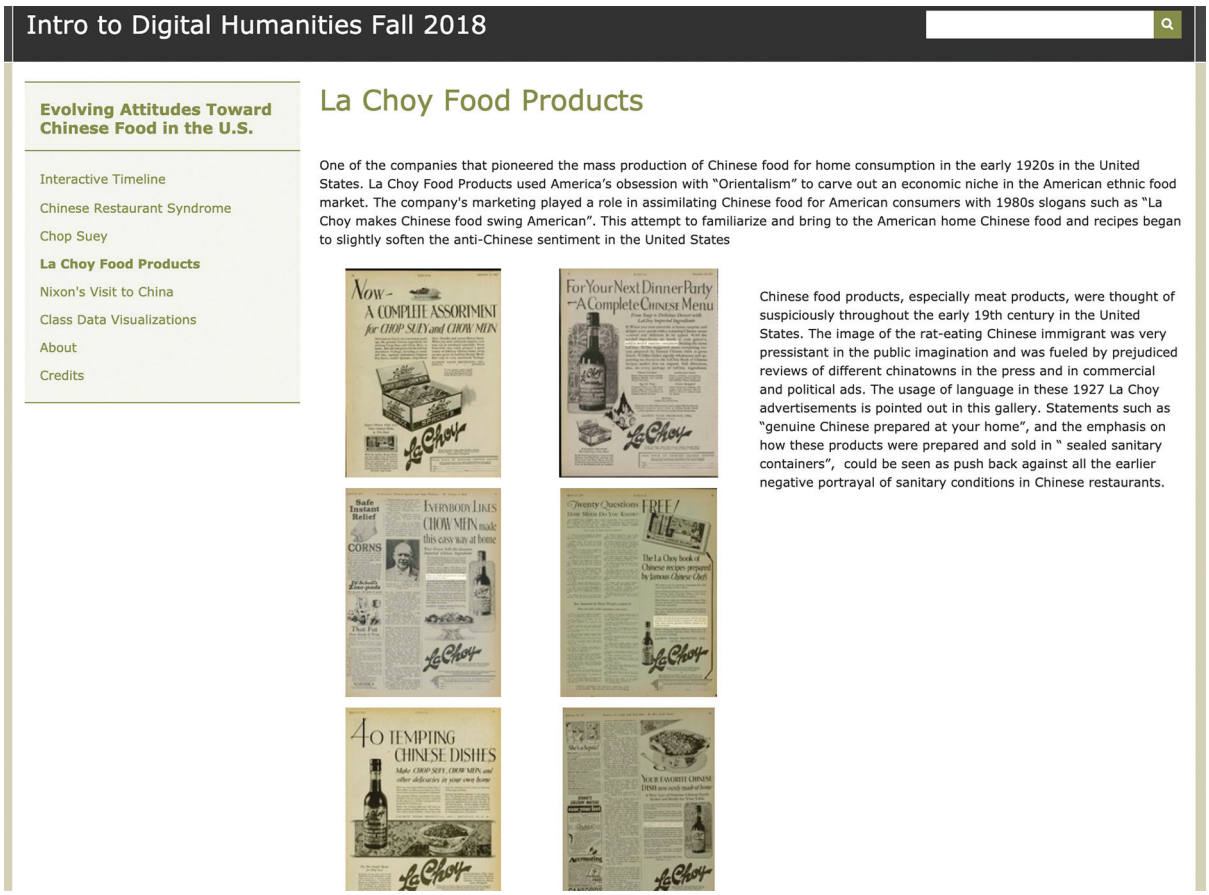

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