Supporting Digital Humanities for Knowledge Acquisition in Modern Libraries

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Chapter 4
Filling the Gap:
Digital Scholarship, Graduate Students, and the Role of the Subject Specialist

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ABSTRACT

Graduate students in the humanities increasingly view training in the use of digital tools and methodologies as critical to their success. Graduate students' interest in becoming familiar with digital tools often accompanies their awareness of a competitive academic job market, coupled with a recognition that teaching and research positions increasingly call for experience and skills in the Digital Humanities (DH). Likewise, recent debates over DH's role in the future of humanities scholarship have heightened the sense that DH skills can translate to crucial job skills. While many graduate students receive encouragement from faculty to pursue digital scholarship, individual academic departments often have limited resources to prioritize the development of these skills at the expense of existing curricular components. This chapter looks at initiatives at the University of Michigan Library that demonstrate the ways in which subject librarians, in collaboration with data and technology specialist librarians, can fill this gap by creating opportunities for graduate students to develop DH skills.

INTRODUCTION

Graduate students in the humanities increasingly view training in the use of digital tools and methodologies as critical to their success. Graduate students are acutely aware of the highly competitive nature of the academic job market, and they also recognize that teaching and research positions increasingly call for experience and skills in the Digital Humanities (DH). Likewise, recent debates over the role of DH in the future of humanities scholarship have heightened the sense that experience with DH is becoming a crucial prerequisite for academic employment. Smith (2010) and others have argued that graduate

education needs to reform in order to adjust to a changing scholarly and professional landscape. One crucial component of that reform involves rethinking the dissertation and allowing students to create collaborative, interactive digital projects that reflect the ways in which "digital media and computational technologies are radically transforming how knowledge is produced, communicated, and evaluated" (Smith, 2010, para. 5). Similarly, a recent Modern Language Association (MLA) report advocated that graduate programs incorporate a deeper engagement with technology (Alonso et al., 2014, pp. 13-4).

With consideration for the existing academic and professional pressures that graduate students experience, librarians see a growing desire among graduate students to become involved in DH projects that is outpacing the opportunities for them to do so. While many graduate students have a sense that there are benefits of pursuing digital scholarship, individual academic departments often have limited abilities, interest, and resources to prioritize the development of these skills and opportunities at the expense of existing curricular components. In addition, many advisors still counsel their students not to devote energy to digital projects at the expense of focusing on their dissertations. Experimentation with digital methods and new formats continues to be perceived by some as appropriate only after traditional milestones in the academic career path have been achieved. Graduate students who may be curious about DH as a field, as well as anxious that being left out could hamper their chances on the job market, are often keeping their eyes open for ways to become involved in digital scholarship. This chapter argues for the ways in which subject librarians, in collaboration with data and technology specialist colleagues in the library, can fill this gap by creating opportunities for graduate students to develop DH skills.

As Schaffner and Erway (2014) have recently argued in an OCLC report on whether or not research libraries should direct resources toward developing DH centers, the "needs and desires of digital humanists can be addressed in a nuanced way, and tailored to demand.…Only rarely will a director need to sink resources into a DH center" (2014, p. 8). In this model, subject librarians are crucial to supporting DH work, especially in the absence of a DH center. Likewise, Alexander, Case, Downing, Gomis, and Maslowski (2014) have suggested that "libraries can play a key role in supporting and promoting digital humanities scholarship, especially on decentralized campuses" (para. 1). This chapter focuses on experiences at the Ann Arbor campus of the University of Michigan (U-M), a public research institution with 43,000 students and 99 graduate programs. With over 17 libraries across campus, and over 10 million volumes in its holdings, the U-M Library supports research in a broad range of disciplines. In the absence of a DH center, and on a campus where there are relatively few opportunities within academic departments for graduate students to work on funded DH projects, subject librarians and technology specialists in the U-M Library have found ways to collaborate with each other, students, and faculty to offer both educational and project opportunities. This chapter will highlight some specific experiences creating opportunities for graduate students to explore DH and argue that the library can and should play an increasing role in supporting graduate training in digital scholarship, especially at universities without DH centers. Key to this support is the creation of low-stakes opportunities in the library for graduate students to gain experience in digital scholarship.

BACKGROUND

As evidenced by a growing body of literature, research libraries are dedicating significant time and energy to supporting and collaborating with scholars in DH, although less emphasis has been placed on developing programs aimed at training graduate students. Though there is widespread agreement that

libraries can and should support DH, the written conversation thus far reflects significant variation in approaches for building, situating, and maintaining DH service models. While graduate students and emerging scholars are not absent from these conversations, they are often described as competent DH practitioners headed for promising alternative academic (alt-ac) careers, rather than students in need of training and support. Literature on graduate student training in the humanities is characterized by some agreement that DH training is worthwhile, coupled with recognition that departments and associations need to develop means for evaluating digital scholarship. The literature is relatively sparse on the topic of training graduate students to incorporate digital methods into their work as students.

Much that has been written on libraries and DH has focused on the nature of partnership and collaboration, with some attention to the sense of community that DH projects can foster. For example, Vandegrift and Varner (2013) have described libraries and the humanities as natural partners, both "tasked with collecting, organizing and preserving our shared, collective memory" (p. 76), and both in positions to prove their continuing relevance, as they experience a "challenging historical moment where external critics are questioning their value" (p. 67). Arguing that humanists' adoption of digital tools has "had an invigorating effect on both scholarly research and pedagogy," Vandegrift and Varner (2013) found that emerging library resources and services are specifically poised to interact with DH projects by directly contributing to the production of "tangible products of scholarly work" (pp. 68-69). Though they enumerated several areas in which libraries and the humanities can help each other develop, Vandegrift and Varner did not explore the library as an environment for training emerging scholars. Vandegrift and Varner did see the library as a place where "scholars with graduate degrees" may turn, as they "pursue careers outside the traditional tenure track," but they described only a "crop of so-called Alt-Acs" who are eager to "exercise" their skills and did not touch on the needs of graduate students who may wish to learn and develop skills before entering the job market (p. 71). Though Vandegrift and Varner touched on the development of skills and expertise, they did not focus on the role of the library in contributing to the education of graduate students but instead called for librarians to shed their "timidity" and "proudly identify as DHers" (p. 76).

Nowviskie (2013) has also recognized an influx of "alt-ac scholar-practitioners" who are "newly positioned in libraries and in the digital humanities across a variety of cultural heritage institutions," but her primary concern was in describing and advocating for a "skunkworks" incubator model that facilitates research and development (R&D), provides "patronage" and "protection" for DH practitioners, and necessarily defies what she described as a "shop-worn" service-oriented culture that is established in most libraries (pp. 56-57, 59). Accordingly, Nowviskie gave more attention to the task of protecting already competent alt-acs from the administrative demands that typically accompany employment in academic libraries than to libraries' potential role in teaching, training, and providing services for emerging scholars in DH. Indeed, Nowviskie implied that such training has already established a foothold in departments when she described a "DH-driven methodological turn in graduate training" with origins extending to "the late 1990s across the humanities disciplines" (p. 58). However, it remains unclear where and to what extent this kind of training has taken hold in a significant way. For example, Rutner and Schonfeld (2012) recently found that scholars in history who incorporate digital methods are "self-taught to a great extent" (p. 29). Additionally, graduate students who were interviewed for Rutner and Schonfeld's Ithaka report expressed frustration at receiving insufficient methodological training in general, noting in particular a lack of expertise for preparation in working with "non-document based sources" (p. 38). In May of 2014, the Modern Language Association released a report on the work of its Task Force on

Doctoral Study in Modern Language and Literature, highlighting an urgent need to "engage more deeply with technology," noting that "mastery of basic digital humanities tools and techniques should be a goal of the methodological training offered by every department" (Alonso et al., pp. 13-14).

Elsewhere, Nowviskie has addressed necessary training and exposure to DH tools and methods for graduate students. Writing in *The Chronicle of Higher Education*, Nowviskie (2012) provided a detailed description of the Praxis Program at the University of Virginia's Scholars' Lab. With the goal of providing "soup-to-nuts training in software development for humanities research and exchange," the Praxis Program is a "competitively awarded, yearlong, paid apprenticeship" designed specifically for "emerging scholars and tech-savvy knowledge workers in the humanities" (para. 3-4). It should be noted, however, that dedicated training programs like Praxis and the Digital Humanities Summer Institute (DHSI) (http://www.dhsi.org) are not available to most humanities doctoral students. While they provide tailored methods training, they do not reach graduate students at scale or in the curricular manner recommended by the MLA report. Praxis, for example, admits cohorts of six students per year (Nowviskie, 2012, para. 9). Likewise, although DHSI offers scholarships and tuition reductions for students affiliated with the sponsoring organizations, the CDN$950 tuition plus travel and lodging expenses is cost prohibitive for many graduate students. Though these programs serve a valuable purpose for the talented cohorts who earn entry, they benefit from being complemented by the iterative, consultative, workshop-based training that libraries are well versed in providing in collaborative, supportive, learner-centered ways.

Furthermore, Nowviskie (2013) appeared not to consider the library's strengths in teaching and consultation as she argued for an admittedly "uncomfortable" separation between the library as service organization and as R&D lab, explaining that the "impulse" to provide "self-effacing service" in a manner that minimizes distraction does not help with the progress of an R&D agenda (pp. 58, 63). Unfortunately, this view of the library has failed to account for teaching and consultation services that seek to help students develop critical research and professional skills in line with a university's teaching mission. For universities without DH centers, the service orientation of the library can be leveraged to complement the teaching goals of departments that seek to equip their graduate students with DH training.

Green (2014) has offered a useful model in this vein, employing the concept of the "community of practice" (p. 220) to document and advocate for a unique and productive relationship among librarians and emerging DH scholars. According to the model that Green articulated, librarians do not provide training and support "simply to inculcate scholars with the latest software; rather, librarians and scholars work together to facilitate scholars' entry into the communities of practice that make up digital humanities" (p. 222). By examining several case studies in which librarians trained and collaborated with scholars in text encoding projects, Green (2014) found that librarians played key roles in facilitating scholars' entrance into these communities of practice as well as sustaining the resulting communities over time. Notably, in the case of Indiana University's Victorian Women Writers Project, librarians worked in collaboration with "English faculty, digital library programmers, and other library colleagues" in order to successfully teach text encoding to graduate students (Green, 2014, p. 224).

This potential for libraries to provide training opportunities for emerging scholars is reinforced to some extent by Posner (2013), who has described the difficulties of providing DH services to faculty. Posner offered the reminder that "what we now call digital humanities grew out of a set of practices, and a community of practitioners, which themselves arose in libraries and archives" (p. 44). As Posner pointed out:

Few scholars are really trained to understand the larger environment of digital humanities tools, projects, and methods and it can be very challenging for a librarian charged with 'supporting' a project to dissuade a faculty member from barreling ahead with a half-baked idea. (p. 46)

If libraries are able to contribute to graduate level training in DH, especially in collaboration with faculty and without the same high stakes that accompany funded projects, they may help rectify this lack of understanding.

Though the literature on DH and libraries is thin on teaching and training, emphasis on collaboration is prominent. Vinopal and McCormick (2013) have proposed a tiered model for providing digital scholarship support, guided by the principles that "Services should be sustainable....and scalable (in order to benefit as many scholars as possible)" (p. 31). While this model emphasized an institutional commitment to project scoping and planning work, accompanied by efforts to create clarity in user expectations, it also envisioned librarians as brokers of "expertise" and called for "librarian-scholar collaboration" that includes "much more librarian engagement…than ever before" (pp. 31, 40). Similarly, Vandegrift and Varner (2013) have argued that a "convergence of values" is at the heart of "library partnerships in digital humanities projects" (p. 69). Somewhat surprisingly, and in stark contrast to the pro-partnership literature, Schaffner and Erway (2014) have argued that DH scholars are "fiercely independent," "prefer to be self-sufficient," and that it does not "occur to many digital humanists to seek help from the library" (pp. 7-8). Moreover, while most of the literature grapples with how to provide support without questioning libraries' general capability to do so, the OCLC report cautioned, however pessimistically, that DH projects create "demand for technical skills that are still rare among scholars and librarians alike" (Schaffner & Erway, 2014, p. 7). While the OCLC report offered alternative options for supporting DH, it failed to account for graduate students as recipients of these services in any meaningful way.

With the noted exception of Green (2014), studies that depicted graduate students as potential beneficiaries of training in digital methodologies have not viewed libraries as loci for training and education. For example, Rumsey (2013) has articulated the emergence of a "translational humanities" in which "a cadre of expertly trained humanists" applies its knowledge and expertise outside of the academy, with heavy reliance on digital engagement (p. 2). But similar to Vandegrift and Varner (2013) and Nowviskie (2013), Rumsey (2013) has primarily envisioned the library as a landing place for humanities scholars, rather than a training ground, highlighting the alt-ac path by which humanities graduates move "into libraries and laboratories to advance the collaborative and iterative nature of digital knowledge creation" (p. 6).

In contrast to Rumsey's focus on the "expertly trained," Reid (2012) has focused on the nature of training, but without consideration for a library role. Reid has articulated an ethical imperative to provide graduate students with digital skills and literacies, arguing that while digital media will not "alter the underlying goals of humanities research," it will cause change in the "everyday practices" of humanities scholars, ranging from routine communication to reviewing, editing, and publishing activities (pp. 363, 365). For Reid, these changes to scholarly practice and their relationship to the emergence of DH justify a "reformation of graduate education" (2012, p. 363). Though Reid did not mention libraries as partners in this reformation, libraries maintain a long-standing role in teaching and supporting graduate students as they learn to perform the everyday scholarly activities that he articulated and should be active participants in efforts to reform graduate education vis-à-vis the production of digital scholarship.

Though the library literature on DH has not been particularly attentive to graduate students' needs, there is useful research on library participation in the reform of graduate education more generally. A notable example is an Association of Research Libraries report by Covert-Vail and Collard (2012) in

the *New Roles for New Times* series on "Research Library Services for Graduate Students." Following interviews with libraries that actively provide graduate student services, Covert-Vail and Collard (2012) recommended several strategies, including the provision of services that support the "full spectrum of the graduate student lifecycle," the alignment of library services with other services on campus in order to leverage "complementary strengths in people, space, and technology," and the encouragement of "innovation, experimentation, and learning" within libraries in order to improve efforts to serve graduate student needs (pp. 6-7). Additionally, Covert-Vail and Collard (2012) addressed the benefits of collaboration among subject librarians and technology specialists, arguing that "the full spectrum of graduate student needs requires both subject specialists and programmatic or domain specialists, including instructional services, scholarly communication, IT, data specialists, and even basic information literacy" (p. 18).

While Covert-Vail and Collard (2012) did not specify DH explicitly as a field, DH's varied curricular and methodological demands deserve attention from libraries that is very much in line with their comprehensive treatment of graduate student services. In a widely circulated response to Schaffner and Erway (2014), Nowviskie (2014) has argued in favor of efforts to "collectively assert the agency of librarians to make changes proactively—to acknowledge they have the right and responsibility to structure initiatives and shift resources not just in response to faculty requests, but in considered anticipation of them" (para. 4). Arguably, this agency and anticipation can and should also apply to library goals for supporting graduate students, with the understanding that their individual paths may lead to academic, alt-ac, or non-academic careers.

DISCUSSION: HOW LIBRARIANS CAN HELP SUPPORT DH WORK BY GRADUATE STUDENTS

While a variety of frameworks for conceptualizing DH and the library's role in supporting such work have been outlined above, the experience at U-M shows that the library can play an even greater role in providing training and project opportunities for graduate students interested in gaining experience in digital scholarship. As the following discussion illustrates, there exist a number of direct, scalable, and low-cost interventions in graduate education in DH that subject librarians and technology specialists in the library can implement at their libraries regardless of the presence of a DH center or similar centralized infrastructure. Crucially for graduate students who may be balancing the demands of dissertation research with the desire to gain skills in DH, the projects and opportunities at U-M can be seen as low-stakes because they offer chances for engagement without requiring the wholesale commitment of one's entire research agenda.

Subject Librarian Consultations

One direct and low-stakes method of helping graduate students gain experience with digital scholarship is through one-on-one conversations with subject librarians, a service that is already widely advertised through liaison outreach efforts. In many ways, this mode of support fits most clearly into the existing subject specialist model and is an immediate way that librarians can help support DH work by graduate students. When graduate students approach subject librarians to discuss their projects, librarians are also in a position to advise them about whether or not digital approaches and methods, such as text mining

or creating a database or interactive timeline, would move their project forward in productive ways and help them to answer the research questions that they care about. In this way, discussions about digital methods can emerge organically from a consideration of the research questions driving a specific project.

In order for such an approach to be effective, it is not necessary that subject librarians be experts in the field of DH, but only that they are aware of the possibilities for various methods and approaches. As with many aspects of librarianship, subject librarians can point researchers to places in the library or on campus where they can get additional, specialized help. By working collaboratively with other librarians and units that offer expertise, subject librarians can support digital scholarship even when the exact methods to be undertaken are beyond their immediate field of specialization. For example, a recent discussion occurred between U-M Library's English Language and Literature Subject Librarian and a graduate student who was interested in creating a robust and interactive online timeline both to help him better understand the material he was studying and to make his research publicly available. In order to best support the graduate student's goals, the Subject Librarian collaborated with the Data Visualization Librarian, who in turn suggested additional campus units that might be able to work on the programming aspect. As is the case with many areas of librarianship, the librarian's role is not always to have the answers, but rather to direct researchers toward the resources they need.

Technology Consultations

Another important means for advising graduate students on ways in which digital tools might enhance their scholarship is in one-on-one consultations in digital labs, such as the The Knowledge Navigation Center (KNC) situated in the Hatcher Graduate Library at U-M. The KNC provides space for graduate students to access tools, hardware, and expertise for producing digital content. Since its inception in the mid-nineteen nineties, the facility has encouraged and enabled the creation of digital scholarship, including digital humanities work, by scholars at all stages of their careers. Projects that the KNC has facilitated include a multimedia Chaucer edition, an interactive web-based tool to assist in analyzing Blake's poetry, and web-based family histories. The KNC has dedicated professional library staff and hourly graduate and undergraduate student consultants available to help with website design and creation, graphics design and creation, digitization, image manipulation, optical character recognition (OCR) technologies, audio/video editing, and more. Another cluster of services known as Spatial and Numeric Data Services (SAND) are situated within the Clark Library for maps, government information and data services at U-M. This group, which includes our Visualization Librarian, offers support for working with data and presenting it in diverse formats including maps. As disciplines throughout the humanities, such as history and archaeology, increasingly turn to GIS (Geographic Information Systems), mapping, and visualization, this has become an important service for DH consultations.

Facilities like the KNC and SAND are essential resources for developing skills in DH technologies and understanding workflows for digital projects. The KNC is a facility open to anyone at the university, but is specifically marketed towards and utilized by graduate students. In this low-stakes environment, equipped with both digitizing equipment and technology consultants, students and faculty can learn and engage with technologies to ensure they will be a good fit before putting time, energy, and money into a project. A core set of software programs are licensed and made available in this space, and the Instructional Technology Librarian is experienced in evaluating tools, technologies, and in consulting about project needs. Graduate students and faculty can make individual appointments to discuss digital projects, gain understanding of the available software options, and hear advice about the pros and cons

of each tool as it relates to their particular project, skillset, training options, and level of support needed. The Instructional Technology Librarian also learns new programs to meet constantly changing campus needs and collaborates with data and subject librarians to offer support beyond any one area of expertise.

Digital media facilities like the KNC are not DH centers, but are well positioned to support DH projects through consultations, workshops on specific technologies, and by making equipment and space available. Often staff in these types of facilities have an opportunity to engage with students and faculty across all disciplines, which makes them aware of graduate students working on projects that might be of interest to DH scholars. As in the case of Subject Librarians, staff do not need specific expertise in DH scholarship to be helpful, but they can act as a hub for information gathering and sharing by being aware of digital projects across campus. It benefits these types of spaces to be aware of projects and needs in the DH community and to specifically target people in those areas in their marketing and communications efforts. Opening the door to collaborations with DH graduate students and faculty will ultimately lead to increased opportunities for collaboration and developing services.

Instruction for Classes

Course-integrated instruction is another way that librarians can help facilitate low-stakes digital projects for graduate students. At U-M Library, one example of a low-stakes project involving graduate students came from a graduate-level Screen Arts and Cultures course on Visuality and the World Wide Web. The professor contacted the Screen Arts and Cultures Subject Librarian and the Instructional Technology Librarian because she wanted to develop a semester-long project that would allow the students to gain an appreciation of the labor involved in producing digital media, as well as to gain experience in the process, instead of just reading theories about it. Based on the scope, scale, and technology constraints and requirements, it was decided the students would research, curate, and create an online exhibit using the library's Omeka installation and materials from the library's special collections. The U-M Library's Special Collections has a collection of film archives in the Mavericks of Film Collection which intersected nicely with the disciplinary focus of the class. The Mavericks of Film Collection features the archives of Robert Altman, John Sayles, and Orson Welles and contains scripts, production documents, storyboards, legal documents, photographs, personal correspondence, personal journals and props - materials which illuminate the history of filmmaking and the creative processes of these influential filmmakers. These collections were fairly new to the library at the time of this project and had not yet been fully processed, and thus they represented a rich field for exploration.

Through this project, the students in this class were exposed to collections that were not yet open to the public and, as a result, gained a behind-the-scenes understanding of how materials are processed, organized, cataloged, and made accessible. Then, following from and incorporating that experience, they learned to curate and imagine the same objects within the context of Omeka and its metadata structure by laying out a visual logic that could become an exhibition. By performing the labor of digitizing, organizing, and describing the archival objects of interest to them, the students were able to better understand how the library functions today and to think more carefully and critically about the metadata produced and used in digital projects around the world. In this way, the library was able to offer a valuable hands-on experience in digital methods for students in this graduate class.

Lessons Learned from Undergraduate Pedagogy

While course-integrated instruction has been a useful means for including DH instruction in the graduate curriculum, there is also much to be gained from examining and applying recent developments and advances in transforming undergraduate pedagogy in ways that draw on DH methodologies. These transformations are most visible in shifting modes of analysis in the classroom through the use of digital tools and through experimentation with project-based assignments. Both subject librarians and technology specialists in the library have opportunities to participate in and contribute expertise to undergraduate classes that are integrating digital tools, and these insights could be usefully applied to the graduate curriculum, especially in light of the recent debate over revamping graduate studies in the humanities and allowing a broader range of dissertation formats. As Cassuto and Jay (2015) have argued, the dissertation needs to be flexible enough that graduate students can tailor a project to fit the kind of work they are ultimately interested in pursuing; as Cassuto and Jay put it, "we need to build the shoe to fit the foot, and not the other way around" (p. 85). Librarians have already played a significant role in supporting pedagogical experimentation in the ways that students interact with course material and express their ideas in the undergraduate classroom, and this role provides a useful model for supporting DH work at the graduate level.

Recent innovations in applying DH approaches to undergraduate pedagogy are part of a larger debate about ways to use technology to advance student learning, as well as conversations about the role of DH in the undergraduate curriculum. Daniel O'Donnell, an Associate Professor at the University of Lethbridge, has advocated a DH-influenced assignment that he terms "the unessay" in place of traditional essays. As O'Donnell explains,

... the essay form, which should be extremely free and flexible, is instead often presented as a static and rule-bound monster that students must master in order not to lose marks....Far from an opportunity to explore intellectual passions and interests in a personal style, the essay is transformed into a formulaic method for discussing set topics in five paragraphs....The unessay is an assignment that attempts to undo the damage done by this approach to teaching writing. It works by throwing out all the rules you have learned about essay writing in the course of your...education and asks you to focus instead solely on your intellectual interests and passions. In an unessay you choose your own topic, present it any way you please, and are evaluated on how compelling and effective you are. (O'Donnell, 2012, para. 3)

This emphasis on flexibility and finding a form of expression that makes sense according to the researcher's ideas about a topic echoes the calls for rethinking the dissertation as a more flexible form that matches the author's ideas, rather than a set format determined by tradition. In a 2013 talk at U-M on "How Not to Teach the Digital Humanities," Ryan Cordell showcased the broad spectrum of digital and print-based projects that his students produced when freed from the conventional essay structure and given the unessay assignment (Cordell, 2013). These experiences with the unessay provide evidence to suggest that options for using digital tools and approaches allow students to think creatively and productively about how to convey their ideas. To be sure, applying a similar approach to the dissertation would also require new ways of thinking and evaluating among faculty advisors, but this is arguably necessary for any initiative that seeks to reform graduation education in a meaningful way.

Another important voice in articulating the value of integrating DH approaches in the undergraduate classroom is William Pannapacker, who has articulated the role of DH in the liberal arts context. In "Stop Calling it 'Digital Humanities'" (2013), Pannapacker argues for the continuity between liberal arts values and innovations in pedagogy and DH approaches in the classroom. As he puts it:

Even before DH arrived, liberal-arts colleges were moving from traditional, lecture-based courses toward a model of teachers and students as co-researchers, collaborating across disciplines and cohorts, attempting to build projects that can serve a wide range of needs, seeking support for those projects, and presenting that work at conferences and now, increasingly, online. In that context, DH is not a "disruption"—it is an enhancement of the core methods of an ideal liberal-arts education. (Pannapacker, 2013, para. 8)

Pannapacker's formulation of DH pedagogy draws on ideas about student learning in an atmosphere where students and faculty are viewed as research collaborators and where students have multiple opportunities and options for presenting their ideas, both in the spaces of the classroom and in public. This model differs greatly from the traditional model of the faculty member as sole expert on the course material and sole audience and arbiter of student work.

In our experience at U-M, digital tools and DH approaches as articulated by O'Donnell, Cordell, and Pannapacker have made a considerable impact on the undergraduate curriculum when viewed as an analytical approach to a wide variety of humanities subjects. At U-M, we have observed digital tools and forms of digital scholarship being integrated in the undergraduate classroom as a means to extend the forms of analysis that are integral to the disciplines. Key to supporting these new developments is subject librarian and technology specialist librarian involvement in helping both faculty and students identify and navigate tools and approaches that make sense within a course's subject matter. For example, librarians at U-M have recently been involved in an undergraduate English class on intertextuality and *Moby Dick* that uses digital tools such as tag clouds for literary analysis. These tag clouds are created by students marking up and tagging their own reflective posts about the readings and are aimed at drawing thematic links between and across the novels being studied throughout the semester. Alongside the students' analytical work marking up and tagging their responses to the texts, librarians played a key role in this class by offering advice about tools that would accomplish the instructor's pedagogical goals, as well as by leading a session to contextualize this exercise in a broader and more theoretical DH framework. In examples such as this one, subject librarians and technology specialists in the library have been able to play an important role in supporting digital pedagogical innovations because of their subject and technological expertise.

Likewise, in a lower-level undergraduate course, a faculty member wanted to experiment with using digital tools to allow his students to create online exhibits in a class about the relationship between poetry and history. In order to prepare the students for the assignment, the English Literature Subject Librarian and a Technology Specialist Librarian offered complementary instructional sessions focusing on different aspects of the project: the English Literature Subject Librarian helped the students discover high quality digital materials, such as photographs, maps, and historic documents on the web, and the Technology Specialist Librarian led a workshop on creating a WordPress website on which they could mount their exhibits. Although this assignment included many of the elements of a traditional research paper - finding sources, constructing an argument, and explaining the relationship between evidence and claims - students brought a high level of enthusiasm and engagement to the project because they

were doing something that felt new and hands-on. Neither the instructor nor the librarians needed to be an expert in all aspects of the project for it to work; rather, they collaborated to ensure that the students had the tools they needed to succeed.

Librarians at U-M have also been directly involved in teaching courses focused on digital methods. This past year the Visualization Librarian co-taught a course with the Assistant Director of U-M's Institute for the Humanities. This one-credit course was entitled *Mapping Moby-Dick* and the students were asked to create maps or data visualizations rather than essays in order to analyze the text in depth. Students read *Moby-Dick* and explored the text in class both through lectures and seminar-style discussions of their readings. The course, though, also offered introductions to various methodologies for making maps and data visualizations, such as an introduction to network analysis, GIS, etc. For the final assignment the students had to propose and create a visualization that critically engaged with the text. For instance, one student produced a subway map of the meetings of various ships which exchanged news and stories throughout the novel. Another student created a map as a tool to determine the probability that some-one with knowledge of whale migration patterns could find a specific whale during a single whaling season. The instructors met regularly with the students to make sure their projects and data gathering efforts were on course. Ultimately, the students produced very compelling projects that were successful in engaging the novel in critical and surprising ways. In short reflection papers, a number of students mentioned how the process of collecting, analyzing, and representing data from the novel forced them to confront aspects of the novel they would not have noticed if they were writing an essay. In addition to learning new tools and methods, the final assignment encouraged the students to work with the text in an innovative and critical manner.

Innovations in undergraduate teaching like the ones described here foreground analytical, collaborative projects that often draw on digital tools. The emphasis in each of these scenarios is not so much on the tools themselves, but what new avenues of analysis that they open up. Subject librarians and technology specialists in the library are well positioned to observe and contribute to the changing shape of under-graduate pedagogy, as well as to support and advocate for similar changes in the graduate curriculum.

Library-Initiated Projects

In addition to the above-mentioned innovations in pedagogy and services supporting graduate education in digital methods, the library at U-M has been awarded grant funding to design and undertake DH projects that employ graduate students, thus providing another source for direct experience in digital scholarship. One such project created a database of information about a late nineteenth-century promotional magazine from California. This project was housed in the library, but proposed and managed collaboratively by librarians and teaching faculty, effectively creating an opportunity for graduate students to gain experience in digital approaches without having to commit their dissertation research to it. The sense that graduate students were eager for opportunities to become involved in DH without having to commit to a digital project of their own was confirmed by the robust response that the project coordinators received from applicants after issuing an initial call for researchers to join the project team. In the interviews, many graduate students expressed both eagerness to try out DH and frustration that there were few opportunities within their departments for doing so. By managing a large-scale DH project, librarians were able both to support such work among graduate students, as well as to demonstrate to the campus their ability as researchers and collaborators. An added benefit of a project such as this one is that it allows librarians to work directly with researchers on answering the types of questions that are integral to the disciplines.

Libraries can also facilitate DH training for graduate students through hands-on workshops focusing on both technical skills and new research methodologies. In this way, libraries can develop and host forums for exploring what kinds of questions digital methods allow researchers to ask. In workshops sponsored by the library, for example, graduate student attendees need not prepare anything in advance in order to collaborate on a compelling research question and learn (or share) methods that they could apply to a particular corpus or digital archive. Along these lines, U-M Library has recently hosted a day-long THATCamp-style workshop focused on the university's web archive, which includes both university websites and websites related to the history of Michigan. THATCamp, which stands for The Humanities and Technology Camp, is an open, unconference-style meeting where scholars and technologists meet to discuss, learn, and build in informal, collaborative sessions that are proposed on the spot. The most recent workshop at U-M, called "Visualizing the Archive," placed emphasis on defining potential tools and methods for analyzing web archives and served as an opportunity for attendees to gain hands-on experience with visualization, network analysis, and programming tools. Following morning workshops devoted to tools and methods and a keynote presentation, attendees broke into smaller groups to brainstorm project ideas that would incorporate web archives data and the tools and methods introduced. The library designed the workshop as an opportunity for graduate student attendees to gain new skills, as well as a chance to think about the kinds of research questions that they can ask of digital archives and other born digital materials in their own projects.

Challenges

While the U-M Library has been successful in supporting DH work across campus in the absence of a formalized DH center, challenges nevertheless remain. One of the greatest challenges of not having a DH center has been maintaining momentum on campus and offering a coherent vision of the Digital Humanities. While we have been able to offer a number of services, projects, and courses focused on DH, it can be a struggle to effectively build upon previous work when the majority of our efforts have been directed toward individual projects and classes. While working on disjointed projects and approaches can foster an agility that allows us to meet diverse needs and explore a breadth of modes of DH work, this bricolage of projects and services often means that DH work is added on as a supplement to projects or courses rather than being the main focus of a curricular area or of graduate education more generally. As such, the development of skills, technology, and methods can be slow and often aimed at specific projects. Despite this challenge we have found that maintaining a network of librarians, teaching faculty, and students has helped to overcome some of these difficulties. By attempting to link these projects together and share them with the rest of the network and those working on related projects, we are beginning to see some successes in building upon previous work and aligning a vision for DH with campus needs and priorities.

Another challenge for digital humanities scholars working on projects in institutions without DH centers is lack of project management and oversight. Proper project management and oversight can help all areas of a digital project, including the work of ensuring that content makes it online. Moreover, depending on scope, resources, and stakeholder circumstances, digital projects can elapse over long periods of time. Accordingly, good project management must also be mindful of keeping all team members actively engaged. Having a good project manager is especially important for DH projects for two reasons. The first is that digital projects require maintenance throughout the lifespan of the project, and the second is that humanities scholars have historically worked independently. Unlike other disciplines such as the sciences, working as part of a team is a fairly new work style for humanities scholars.

The kind of project management that a DH center can provide is necessary to ensure that digital projects undergo maintenance throughout their lifespan. The work is almost never complete just because a project has been officially published and made available online. Web design, accessibility, and functionality best practices are constantly evolving and, as a result, digital projects and websites must be periodically reviewed and updated in order for online projects to remain findable, useful, usable, and accessible. Many projects require a comprehensive redesign periodically in order to remain in accordance with evolving standards and expectations. One example is the *Cather Archive*, created at the University of Nebraska-Lincoln and which has been comprehensively redesigned twice (once in 2005 and again in 2008) in order to improve the usability and design of the site (Jewell, 2014, paras. 1 and 5). Without project oversight maintenance and continued funding, digital projects can become unusable and inaccessible for a range of users, including, but not limited to, users with disabilities and users on mobile devices. In many cases of large and small-scale DH projects, there is a tension between the scholars' need to be done with a project and move on and for the project to continue to be cared for, updated, and maintained, all of which requires time, money, and expertise.

Likewise, project management, as provided by a DH center, can foster both project oversight and collaboration among humanities scholars, librarians, technology specialists, and other stakeholders. Anyone who has worked on a group project understands the pros and cons of collaborative scholarship. Although scholars in the social sciences and sciences are accustomed to group projects, humanities scholars are used to working independently. As a result they may not seek out project managers or develop clearly defined project goals, which can significantly slow down progress. Project managers set project timelines, ensure the people working on the project have all required resources and determine project needs, which often shift throughout the course of a project.

Despite the challenges posed by not having a centralized DH center, librarians and technology specialists at U-M have collaborated across the library and campus to support graduate students interested in learning more about DH. Without the institutional framework and centralized resources that a DH center provides, librarians and technology specialists in the library must work collaboratively to connect scholars and other stakeholders with expertise and resources in ways that will most benefit a specific project.

FUTURE RESEARCH AND CONSIDERATIONS

While providing educational and project-based opportunities for graduate students on U-M's campus has been highly effective at providing exposure and training, it is important to remember that such support is taking place in a relatively dismal job market for graduate students. Many of the graduate students that librarians at U-M work with on DH issues are very cognizant, even during the early years of their PhD work, about the state of the job market. Many students interested in DH are also trying to position themselves to be competitive in a job market where there is a perception of advantage to those with skills in digital research. Still others seek to develop a skill set that could provide potential job opportunities outside of the traditional tenure track.

Though many DH practitioners are tenure-track faculty, DH is often conflated with recent discussions around alt-ac. While the educational and project opportunities that the U-M Library offers students are helping to meet campus demand, the actual translation of these skills to job markets in and outside of academia likely differ. For instance, Risam (2014) has suggested that the belief that there are significantly more DH jobs than traditional academic positions is likely overstated (para. 9).

In addition to developing and assessing the library's ability to contribute to the educational and professional opportunities that students seek at a given point in time, future research should also consider sustainable long-term mechanisms to prepare students for the shifting academic landscape.

Another question to consider in developing strategies for training graduate students in digital methodologies is how to assess effectiveness. How do libraries continue to assess which research tools and methodologies are most relevant and compelling for graduate students, regardless of whether they are seen as presently advantageous on the job market? Likewise, how do libraries raise awareness of our services for graduate students when these services are being offered in a distributed way outside the context of a DH center? Additionally, how do libraries ensure that our lines of communication and collaboration are being used most effectively? In other words, because much of the support that libraries provide relies on relatively seamless communication and collaboration among colleagues, it is crucial that librarians remain aware of each others' workflows and areas of expertise. Furthermore, what are the best means for establishing a shared understanding of the library's role in graduate education vis-à-vis digital scholarship? All of these are crucial questions to keep in mind as libraries continue developing services.

CONCLUSION

This chapter has drawn on the U-M Library as a case study in order to focus less on the question of whether or not libraries should develop DH centers and more on the role that libraries can and often already do play in graduate education and professional development. Libraries already offer key support to graduate student research, and it is through those channels of support that librarians and technology specialists in the library can also offer graduate students an opportunity to develop their skills in digital research methodologies. Until now, the conversation about reforming graduate education has largely overlooked the ways in which libraries can help graduate students develop their skills within an ever-changing research and professional landscape; however, as this chapter has argued, libraries serve a core function in this process. Because subject librarians and technology specialists in the library are already working to support the teaching and research of the departments and scholars that they serve, they are well positioned to understand the work that is being done and to foster digital scholarship and pedagogy. As this chapter has argued, supporting graduate student education in DH is an extension of the core work already being done by librarians and technology specialists in the library.

In addition to contributing to the university's mission by supporting graduate education and helping graduate students develop potentially marketable skills, there is another advantage for libraries that results from working with graduate students in these ways: increasing libraries' involvement in supporting graduate level work of all types creates multiple opportunities to strengthen relationships with researchers and administrators in academic departments on campus. By helping graduate students think through their research questions and evaluate the relevance of various digital tools, librarians also gain an opportunity to engage researchers and promote learning on campus. Above all, when librarians have conversations with graduate student researchers about incorporating digital scholarship into their projects, they are engaging in scholarly mentoring that reflects their position as peers, scholars, and collaborators with the teaching faculty on campus.

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KEY TERMS AND DEFINITIONS

Alt-ac: Alt-ac, which is short for alternative academic careers, represents academic career paths, choices, and opportunities that depart from traditional tenure-track paths through academic teaching, research, and scholarship.

Data Visualization: The representation of data in visual terms, as in graphs, charts, maps, and timelines.

Digital Humanities: The application of quantitative methods and digital tools to humanities research and scholarship.

Digital Scholarship: The application of digital tools in research methodology and/or the adoption of digital means for communicating and disseminating research results, applied broadly across disciplines.

GIS: GIS stands for Geographic Information System, which is a tool designed for the analysis and visualization of geographic or spatial data.

Graduate Education: Education and professional development for post-graduate students.

Ithaka: Ithaka is a not-for-profit organization aimed at preserving the scholarly record through digital technology.

OCLC: OCLC, the Online Computer Library Center, Inc. is a non-profit library cooperative dedicated to promoting research and access to information.

OCR: OCR stands for optical character recognition, a technology that converts images of text into machine-readable texts. OCR has a wide variety of uses in DH, most notably in rendering scans of printed books into files that are useful for keyword searches or text mining.

Omeka: A web publishing platform for online digital collections. Many libraries and organizations have customized their own versions of Omeka for local use.

Spatial Data: Data that identifies geographic locations.

Subject Librarians: Librarians who provide subject-specific research and instructional support for faculty and students in an academic field.

Technology Specialists: Librarians who provide support with technology through instruction and consultations.