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# Developing Digital Skills through Engaged Scholarship

56-72 minutes

## Abstract

This paper offers a case study of two contrasting digital scholarship internships at The Pennsylvania State University. We explore the benefits and drawbacks of the internship model as an approach to developing digital scholarship among undergraduates through detailing the challenges and particularities of these experiences and analyzing mentor reflection and student feedback. We conclude with a number of recommendations on best practices for teaching digital scholarship through an internship model and aim to provide a useful roadmap for institutions looking to follow a similar model for undergraduate education in this field.

Digital scholarship has never been more important than for the current generation of undergraduate students. The need to develop one's technical expertise is not just a concern for those few students aspiring to a career in academia; competency in the use of computer-assisted methods has relevance for the entire student population. Data analytics, knowledge representation, and dissemination techniques are just a few of the many areas with broad professional application to have undergone technology-

driven transformation in recent decades. Society's reliance on technology is such that the digital has permeated our professional lives, transforming the skillsets expected of students upon graduation.

The integration of digital scholarship in the undergraduate curriculum can further the students' learning experiences and engagement with their core subject matter, but there are numerous obstacles to embedding the skills required into course learning objectives and outcomes. Increasing digital fluencies among undergraduate students in the Arts and Humanities, in particular, presents a number of key challenges: "the technical proficiency of undergraduates and instructors, the timeframe of a single semester or quarter, and the availability of hardware and software" [Bjork 2012, 101].

As a consequence, institutions of higher education are responsible for exploring a variety of pedagogical approaches to digital scholarship, both within and beyond the confines of the classroom. By "digital scholarship," we refer to the practice of leveraging digital methods and computer-assisted approaches to research in the broader Arts and Humanities, and indeed, in related disciplines across the Social Sciences, for the purposes of producing new meaning across a multitude of forms.[1] In turn, there is a need to ensure that students are not simply being trained in the use of intuitive tools to produce artifacts of tactical convenience, but rather, that they are developing a deep understanding of the potential for new and supplementary meaning offered by computational methods, as well as an awareness of the digital's many constraints and the profound repercussions that interdisciplinarity can have for established practices. As Tanya

Clement argues:

> Until we consider digital humanities undergraduate pedagogy in terms other than training, and rather as a pursuit that enables all students to ask valuable and productive questions that make for “a life worth living,” digital humanities will remain unrelated to and ill defined against the goals of higher education. [Clement 2012, 372]

In this paper, we present a case study of an engaged scholarship model–which seeks to complement classroom-based learning with out-of-classroom experiences–as a means to explore an alternative pedagogical approach to digital scholarship. Specifically, we consider two evaluative questions: how effective are internships at developing knowledge and skills in digital methods? What are the optimal student learning conditions with respect to structure, guidance, and supervision to nurture the development of such knowledge and skills? To address these questions, we compare two undergraduate internships which proceeded as part of a collaboration in 2015 between the The Pennsylvania State University Libraries and the College of the Liberal Arts, which saw two independent groups working with undergraduate students on research projects with a significant digital component. At Penn State, there has been little distinction between the Digital Humanities work that is housed within the University Libraries, and that which is primarily led at the academic College-level. The structure of the institution’s Digital Humanities effort, and indeed the interdisciplinary nature of the field, is such that it has a range of interdepartmental stakeholders.[2] Both projects hired two paid interns, who were employed in a full-time capacity for a duration of 13 weeks.[3]

One pair of interns worked on a project which availed of

computational approaches to text analysis for the purposes of exploring the language utilized by online roleplayers. These students worked primarily under the guidance of the Digital Humanities Research Designer, with support from the University Libraries' Publishing and Curation Services, as well as the Office of Digital Pedagogy and Scholarship in the College of the Liberal Arts. In this instance, the students worked collaboratively under minimal supervision on the same project, on a research question of their own choosing. Effectively, this internship was an experiment to see the possibility of undergraduate digital scholarly research supported by resources – time, money, and faculty/staff expertise. For the purposes of clarity, these students will be referred to as the "text analysis interns." The other pairing, which will be addressed as the "geospatial interns," worked with faculty and staff of the Donald W. Hamer Maps Library, and were tasked with helping the library accomplish the goal of increasing digital access to the Sanborn Fire Insurance map collection. This internship was comparable to a traditional professional internship structurally, but with the goal of developing digital skills (digitization, mapping) that transfer to academic research, along with the freedom within the scope of the internship to pursue independent projects as interns developed skills. While the implementation and scope of the projects varied, both sought to adopt a digital-project-as-pedagogy approach, so that interns developed advanced expertise through direct engagement with applied research. In doing so, the intention was that interns would gain a sense of how to conduct research that is of publishable quality, while seeing what is required in bringing a digital project from conception to fruition. By design, the experience allowed students to develop a number of their broader professional skills, such as time and project management, as well as practice

habits of collaboration, all of which would occur in professional environments.

As we begin to evaluate the internship model as a way to develop digital scholarship skills in students, it is helpful to situate the approach within a pedagogical framework. In this case, both internships were envisioned as project-based learning opportunities to enhance the digital skills and professionalization of undergraduate students. This "learn by doing" approach is common in the classroom, and can be equally effective in the field, given the right conditions. In "Perspectives on Learning in Internships," David Thornton Moore challenges the notion that academic learning happens exclusively in the classroom, and that only testing or application of that knowledge happens in the field [Moore 1983, 40]. He argues: "Thinking in the real world may indeed supplement and reinforce school-based learning; but it can also do far more to develop valid and important learning in its own right" [Moore 1983, 42]. Moore puts forth a matrix to evaluate internship experiences through focusing on two dimensions: the ways one uses knowledge, and the ways one relates to others in a particular learning environment. With respect to the mental work of internships, he suggests that we consider how interns are expected to use knowledge: is it fixed and immutable, or are students able to reorganize and transform knowledge? [Moore 1983, 41]. Similarly, we can evaluate the social relationships in particular contexts to see the degree to which interns are relied on and able to participate in the definition and creation of knowledge. This framework provides two spectrums useful for evaluation: is the mental work of the internship more rote and algorithmic, or creative and transformative? And are the social relationships in the environment

hierarchical and controlled, or collegial and participatory? [Moore 1983, 44]. What follows is a comparison of the two internship experiences, using Moore's matrix where appropriate.

## Selection, Planning, and Orientation

In choosing the final candidates, each of the mentors made selections from the pool of applicants based in part on students possessing complementary skillsets, the ability to work collaboratively with others, and a natural curiosity and willingness to learn. However, as noted, there were a number of differences in the implementation of the two internships.

The geospatial interns were supervised by a project team of four–Penn State's Geospatial Services Librarian, GIS Specialist, Maps Library Manager, and Research Data Management Specialist–that worked for three months prior to their start to plan and scope the project. Preparations for the arrival of the geospatial interns included producing a document outlining general professional expectations, organizing introductory reading material on the history of fire insurance mapping–of which the Sanborn collection is a part–producing a step-by-step technical protocol, and developing and writing about goals for project and intern learning outcomes. Interns were oriented to the project by the team at the beginning of the summer and integrated into all project activities from that point forward.

The text analysis interns were supervised by the Digital Humanities Research Designer, though they were largely under the tutelage of the Social Sciences Data Curation Fellow throughout the initial phase of their project during which data management was one of

the primary concerns. In preparation for their start, a general scope of work, with learning goals identified and a rough project timeline outlined, was developed. The project timeline included general phases of research project development, with a lot of flexibility built in to accommodate the students' project. Upon their start, the students were introduced to the goals and expectations of the internship, but then given latitude to define the nature of their research project.

## Roles and Responsibilities

The geospatial interns occupied much of their time georeferencing and extracting data from the Sanborn Fire Insurance maps, and then creating ArcGIS web-based applications to view and search the data. After the initial orientation, interns took over updating the step-by-step protocol as issues arose. Interns also took the lead on researching and developing land-use codes for buildings. Significant guidance was given to the interns on how to create good quality metadata. The varied experiences and skills of the geospatial interns were key to the project. The geospatial intern with a landscape architecture background applied the use of graphics software from architectural coursework. The geospatial intern with a geography background made connections across geographic elements from geography coursework. Interns kept a log of their daily activities and questions on a network drive that was monitored by all team members and served as a diary of sorts at summer's end. Intern updates on activities, difficulties, and progress were also delivered to the rest of the project team during weekly project meetings.

The text analysis interns day-to-day tasks were self-directed and

aligned to their research goals and project design. The text analysis interns conducted a significant literature review, acquired chat logs to to serve as their source data, and worked with mentors to store, clean, and analyze the data. Their study seeks to determine the extent to which online roleplayers make use of lanauge in the construction of narrative, using computer-assisted methods to idenitiy the particularities of the language of online rolepay [O'Sullivan et al. 2016]. The text analysis interns had regular contact with project mentors, but the dynamic was more similar to an apprentice working with a mentor than an employee working with a supervisor.

The level of direction and scaffolding provided to the interns was the most significant difference in the two internship experiences. As outlined above, the geospatial interns received considerable direction at the outset, and regular ongoing feedback throughout the duration. With respect to the mental work based on Moore's framework, though, both sets of interns performed complex tasks and advanced ways of thinking. The digital humanities interns did have more autonomy over their day-to-day tasks, but they still relied on significant guidance from the mentors to develop the digital research skills to complete their research project. Because the geospatial interns were not assigned mundane and routine tasks, but rather, charged with responsibilities that demanded they apply the methods of digital scholarship correctly and adapt to changes in project needs or tasks, both internships provided meaningful opportunities for students to acquire and use "scholarly" knowledge [Moore 1983, 42]. Also, the social relationships in both internships were collegial and participatory. That is, while the geospatial interns worked within a more traditional supervisory structure, they were also included on the research team as active

participants, with a shared responsibility as a vital part of a major project's progression.

The text analysis interns developed their sense of responsibility through ownership, in that they were made aware from the outset that the success or failure of the project would be a direct consequence of their own efforts–saying this, students were made aware that "failure" did not mean incompletion, and that exploration, discovery, and learning were to be privileged over the delivery of expected outcomes. Moore says, "In classrooms, students rarely have the opportunity to be truly responsible - not just punctual or obedient, but to have others actually count on them for something meaningful" [Moore 1983, 43]. The digital-project-as-pedagogy approach in both internships gave students the chance to engage in meaningful projects that required them to think critically, adapt to changing demands, collaborate with colleagues, and identify when they needed guidance and feedback.

In this section, mentor and student intern perspectives give some insight on the approaches and outcomes of the internship experiences. The mentors provide a self-reflective account of the internships, while the student perspectives are based on a thematic analysis of a qualitative survey which was conducted upon completion of their employment.

## Mentor Perspectives[4]

A number of common challenges emerged across both internships, along with a variety of project-specific issues that arose. The first challenge was the selection of the candidates since mentors not only had to choose the students with the most direct experience, but rather, to pair individuals with complementary skillsets who we

felt would function well within a collaborative setting. The text analysis project also required students who could work independently, conducting the unsupervised research necessary to further both the theoretical and technical aspects of their project. In this instance, particularly in relation to the text analysis project, there was also a need to judge the motivations of applicants–while curiosity among undergraduates is to be encouraged, there was a sense that many of the students were more interested in securing an internship–*any* internship–than they were in the Digital Humanities as a subject matter. In essence, we found the selection of the candidates was not just about experience, but a balance between aptitude, attitude, and interpersonal skills. In both instances, the aim was to select interns who would be able to leverage their skillsets in different and mutually beneficial ways. There is some tension in this approach, as it opposes most other pedagogical contexts: where the process of choosing candidates for an internship is highly selective, in the classroom you are typically not in a position to engineer your learner-dynamic. The aforementioned tension emerges from the realisation that the impact of such initiatives, which are not necessarily replicable in a broader range of contexts, is limited.

As outlined, one of the key differences was that the geospatial interns were assigned to an existing project, whereas the text analysis students worked on a research topic of their own choosing. When creating internships involved with a pre-existing project, it is important to consider the level of interest and student engagement. In the case of the geospatial interns, student engagement was fostered by continual positive social interaction and role-modeling professionalism and engagement of all team members throughout

the project. This generated the essential sense of ownership inherent in the alternative student-driven project, while also giving students a sense of collaborative responsibility. With the text analysis interns, the mentors felt it was vital that the project's focus was student-driven, as this would ensure their commitment to the undertaking when faced with the inevitable technical barriers throughout the processes of gathering and analysing the data. In the text analysis project, any potential failure would be the students' own, whereas in the geospatial internship, students were aware that their component was an essential part of a larger whole, and thus, benefited from the experience that comes from working within a broader team. The geospatial interns benefited from having clearer milestones and indicators of success given the larger project context they were working within. The text analysis interns had to navigate through the uncertainty of conducting research employing digital humanities methods, absent the structure of a more typical professional internship. There are tradeoffs to consider in both internship models, with one privileging technical and skill development, and the other prioritizing more holistic research skill development.

As noted, the two projects adopted different approaches to supervision. The model used to supervise the geospatial interns was one of co-supervision shared by three individuals, with the supervisor in closest proximity to the workstations of the interns serving as a daily point of contact. The mentors felt that it was important to have daily contact with the interns in order to foster collaboration, integrate them into the project, and give them real-world experience working in a professional environment. The entire team also met on a weekly basis to discuss aspects of the project,

alternatives to adopted approaches, and assess progress towards the end goals. This process enabled the students to build communication and negotiation skills, as well as learn to compromise on those elements of the project where a unified vision was needed. In contrast, the text analysis interns worked very much in isolation, liaising with their mentors as their research requirements dictated. Over the course of the project, direct meetings were predominantly reserved for those instances where the students required instruction in a specific methodology. There were some clear benefits to this approach, in that the students seemed to cope well with the demands of a project's initial research requirements: they produced a very thorough literature review, and were proactive in the gathering of a suitable dataset. However, the chief supervisor also noticed considerable scope creep at various junctures, and that between meetings, students had wandered from the guidelines offered during previous interactions. On multiple occasions, the mentor found it necessary to remind students of their central research question, and how best to re-focus their efforts on answering that question. Upon reflection, this approach gave the students a real sense of the demands of independent or small-scale collaborative research - which is still the major component of research-based positions, even in the Digital Humanities - but that some further direction would have certainly helped the students achieve their intended deliverables.

The geospatial interns were exposed to other units and departments within the library so that they could situate their projects within a wider professional context. It was important for them to learn how the project related to other units in terms of deadlines, roles, contributions, and limitations. As noted, the text

analysis interns worked independently, and so they did not further their understanding of how various departments contribute to the institution's overarching strategies. It was hoped that they would spend some time working with the Digitization and Preservation department, but the dataset that their research necessitated did not require digitization, and so this element was removed. The relative autonomy allowed the students to see how scholarly research, and particularly digital scholarly research, is conducted – a significant amount of independent work with points of collaboration with specialists when the project dictates that level of support. Mentors observed that the students' enthusiasm waned in the final weeks of the project. This may have been due to the length of the undertaking, as most undergraduates are not used to projects of this scope, but it may also have been due to a lack of stimulation in what was an isolated setting. We hoped that their interest in the research project would be sufficient to overcome this issue, but there is certainly some merit to suggesting that students should engage with a variety of units and departments if only as an exercise in breaking the monotony of independent research and providing them with some additional context and routine, as well as introducing and fostering a sense of community.

Professionalization was an important part of both internships, the intention being that students would emerge from the experience having developed more confidence in their ability to negotiate workplace dynamics. This was accomplished, in that interns appeared to increase their involvement as the projects progressed, making vital contributions towards the future directions of the projects. Our implementations suggest that a major risk of the internship model is that, in the event that students do not engage,

the investment of mentors' time is a risk without guarantee of concrete rewards, both in terms of project output and student learning. One of the failings in the text analysis internship was the student engagement with the more technical aspects of the project. The nature of the dataset was such that students spent a considerable time gathering and cleaning chatlogs from online games, leaving little time for the analysis phase. While working through a series of computer-assisted methodologies with the interns, their supervisor felt that the students struggled with the volume of information, and had at that point suffered from a loss of motivation. To that end, while they drove the research objective, and gained a holistic understanding of a digital project's lifecycle, the extent to which they expanded upon their technical expertise is less certain. From the perspective of its product, the project was a success, in that the student produced a research report of some significance. From a pedagogical perspective, the students now understand what constitutes rigorous digital scholarship, and the steps required to accomplish such. However, it would have been better if more structure had been provided so as to ensure that they also emerged with more methodological expertise, as this was one of the expected learning outcomes. Supervisors of the geospatial interns reviewed their ouputs during multiple stages of development, including the overall aesthetics of the output, accuracy, consistency, and thoroughness, an approach which the text analysis project could also have been adopted.

In terms of determining the interns' transformation of information, based on observations of their knowledge and experiences at the beginning of the internship compared to their experiences at the end of the internship, it is evident that the work conducted led to a

transformative experience. This transformation can be characterized as the development of knowledge about processes and topics that enable the learners to take their skills and experiences from the internships and transfer them to new situations and activities. Furthermore, these experiences informed the mentors on the importance of focusing on the specific needs of the intern, and how such is often challenged by the surrounding organizational, administrative, and project needs. Internships in this field should privilege the development of a student's digital skills, rather than seek to accomplish any specific research output, though accomplishing such should be encouraged, and indeed act as part of the means by which success is measured. Thus, an intern-centric undergraduate learning experience should be adopted, wherein topics on the periphery of core curricula can be integrated into the project.

## Student Perspectives

As this study is focused on the experiential aspects of the internships as pedagogical models, a qualitative approach was adopted for the analysis of the student perspectives. A common survey was issued to the interns, in which they were asked to respond to three questions:[5]

1. What skills did you develop during this internship, and which do you feel you will use again?
2. What aspects of this internship did you find most beneficial?
3. Were there aspects of this internship that you found disappointing or did not meet your expectations?

The questions were deliberately open, so as to not lead student

responses. Using thematic analysis, we approached the data with two concerns: what insights could be gained in the development of the students' research, technical, and professional skills, and what other, unanticipated themes, emerged across each of the groups? It is worth noting that students were seen as collaborators throughout this process, their contributions to this study a key part of its scholarly value. Furthermore, their participation was very much a success in the sense that they produced outstanding work of considerable substance.

## Moore's Uses of Knowledge

A number of themes emerged from the respondents, the most prominent of which was "problem solving." The interns agreed that this was both the primary skill they developed, as well as the most beneficial aspect of their internship. This is a positive finding, in that it reflects the pedagogical ethos of the Humanities and Social Sciences, seeking to foster critical thinking among undergraduates. It also shows how students, with appropriate training, can learn how unfamiliar technologies and techniques can be applied to the creation of new knowledge and meaning. Interns also drew much attention to the value of those transferable generic skills which they felt would be of use in their future careers. Several of the interns also referenced specific technical skills - it was particularly encouraging to see that the text analysis interns recognized both the technical expertise and broader professional competencies which they developed, as their chief supervisor placed little emphasis on the latter. They clearly realized the broader professional value of the internship, as well as the potential for applying digital methods to a broad range of activities beyond

academia: "I developed skills in technical writing and reading, experimental design, data analysis, data management, and team-based research. I feel that [these] skills will be very useful in my future, no matter what I choose to do."

**Moore's Social Relationships**

The experiences of the interns were clearly impacted by the interpersonal dynamics of their projects:"Working with another intern to help solve problems and make compromises and decisions was one of the most important aspects..."; "I feel like our project really benefited from two of us working together … bouncing ideas off of one another, dividing up the tasks either of us were best suited to, but each contributing even when the other took the lead on one step." The geospatial interns also benefited from working with professionals across different departments and units, while the text analysis students articulated that they achieved the initiative's primary objective of giving them an understanding of how to bring a digital project through its complete lifecycle, from concept to fruition. A related theme–engaged scholarship as having the potential to offer more than what is permitted in a classroom setting–also emerged: "In school, all of our work is done in a single semester and often alone, so working on a project that required we not only think about immediate outcomes, but also future uses and applications and collaborating with others was very helpful."

The majority of students cited a lack of structure as being one of the drawbacks. This criticism was far more evident among the text analysis students, where they were largely left to work independently. Extensive planning was conducted for the geospatial internship, so a reference to a lack of structure in this instance is

possibly due to adjustments being required as the project progressed. This is a natural consequence of any large-scale collaborative project, and so ideally, the need for some level of uncertainty would have been appreciated by the students. A related frustration–the pursuit of blind alleys–was cited by the text analysis interns, which again, is inherent in any such undertaking, and something which we hope they now realize. The extent to which the text analysis interns were allowed to work independently could perhaps be revised in any future iterations of this initiative, in that the students clearly wanted more supervision. The post was advertized and described during the interview process as being an independent study, wherein the internship would largely be driven by the students' own interests and ability to develop new expertise under limited supervision. The extent to which undergraduates can comprehend the significance of such an absence of structure was arguably underestimated. A better approach might have been to facilitate some preliminary, even extensive discussion at the start of the internship about what "independent study" means, especially if this type of academic experience is new to the students. This could be followed by periodical reviews of the *format* of the undertaking and its ramifications for the work. It is also worth noting that the students made no references to any difficulties in mastering particular materials or tasks, which would suggest that this model could benefit from students receiving feedback on where they excelled, and where further improvements could be sought, so as to increase their own awareness of their strengths and weaknesses.

A similar approach to that utilized in the geospatial internship was pioneered at Bucknell University, where undergraduates worked as

research assistants on the Stories of the Susquehanna Valley project.[6] Reporting on the results of their program, Katherine M. Faull and Diane Jakacki conclude:

> Extending the classroom outside (both spatially and temporally) allows for the development of rich, deep knowledge in both digital tools and research subject matter. Indeed, extending the faculty-student collaboration to include students from outside traditional humanities departments also reifies the value of interdisciplinary research at an early level and reflects the professional DH research model employed by larger-scale projects. [Faull and Jakacki 2015]

The experience at Penn State, both in the geospatial and text analysis internships, support these claims. Restating Moore's spectrums of mental work, knowledge engagement and social relations, undergraduate student internships can be interpreted as serving two distinct but overlapping roles in student preparation. First, they can be seen as a direct extension of classroom work where information literacy and critical thinking–or research–are the focus; application outside of the classroom is the learning environment, and learning outcomes are evaluated in relation to student preparation for further engagement with academics. Alternatively, internships also acknowledge the gaps left by classroom preparation and a response to the reality that most students will not become professional academics, but rather will work in a variety of professional settings. In a student-centric internship model, we encourage advisors and supervisors to be somewhat flexible in adjusting the structure and expectations of their interns according to their stated professional goals rather than preconceived learning objectives or project goals. Although not by design, both internship case studies were successful in this regard,

perhaps as a result of careful review and selection of intern candidates. As has already been emphasized, the selection step of an internship plays an important role in setting the stage for internship success and failure from both the perspective of the students and advisors. Any similar undertakings would be best advised to engineer a dynamic which represents the best possible opportunity for success, pairing complementary skillsets and personalities, though these can be difficult to assess, particularly the latter, through a limited application process.

Other institutions looking to implement similar models need to be very clear on their purpose: is the aim to have students develop their ability to negotiate the workplace, or learn how to do advanced research? It is possible to accomplish both, but depending on restrictions on time and resources, it may not be possible to achieve an equilibrium. Nor is it desirable to give students a false sense of a particular dynamic: the reality is that, major interdisciplinary projects excluded, most scholarship is still conducted in a largely isolated manner. This is not to say that we support the status quo, but merely acknowledge that it would be irresponsible to have students believe that a career in scholarship, particularly in the Humanities, will be predominantly occupied by collaborative endeavours–this might change, but most hiring and promotion committees still privilege "traditional" forms of scholarship. Regardless of an internship's stated purpose, students should develop competencies beyond those cultivated in the classroom, and the supervisory team should stress the importance of transferable skills, so that students can see the utility of any newfound expertise. Internships provide an opportunity to liberate students of the constraints of the classroom, affording them the chance to make and learn from mistakes, to explore potentially

fruitless strands of inquiry, and delve deeper into topics of personal interest. When developing a program model in such a context, Moore's framework is helpful to review, considering the extent to which the work will be rote rather than creative or transformative: will there be enough of an intellectual engagement for the internship to be worth it for the student? How controlled is the situation? Will interns have the ability to make a real difference in the project as equals or is the information very controlled and top-down?

Defining suitable barometers for the measurement of success also presents a challenge. The primary purpose of the text analysis internship was to give students a sense of what is required in the completion of a digital project, a condition which, from assessment of their final research outputs, was a success. However, it cannot be said with confidence that they could replicate some of the methodologies that were utilized without assistance, and a future iteration of the initiative would do well to ensure that the project's dataset can be gathered quickly, allowing more time for students to gain familiarity with some of the more technical aspects. This experience was shared by the geospatial interns, who spent a considerable amount of time having to digitize physical materials. When defining those objectives which will determine the success of a project, it is essential to allow for the time necessary to investigate challenges and problems, both technical and intellectual, that arise throughout the research process. Supervisors must also account for seemingly obvious yet often overlooked social realities, like students wanting to take holidays during the summer semester, which was when these internships took place.

The danger in such programs is that mentors will impose their own

value systems on their participants, expecting them to adhere to scholarly principles and standards that undergraduates cannot reasonably be expected to have attained. Even faculty with extensive teaching experience might find that they are demanding too much of participants who are embarking on what is likely their first major research undertaking, and expectations must be continuously revisited *before* the project begins so as to ensure intended outcomes are realistic. While it is important to have a clear set of expectations before the project begins, flexibility is crucial, as it affords interns the scope necessary to pursue unforeseen developments, thus emphasizing learning outcomes over tangible deliverables. Students must not be afraid to "fail," for any such fear will restrict critical and creative exploration. Equally, considering the value of the opportunity, the demands placed on interns should be as challenging as they are reasonable, and mentors need to be comfortable reprimanding any participant whose performance might not be meeting expectations–this is difficult, in that you may well be dealing with inexperienced individuals with whom you have started to build a rapport atypical of what is usually established between faculty and undergraduates. Striking a balance between authority and understanding is a leadership quality that is not easily attained.

Institutional limitations must also be considered–the reality of engaged scholarship is such that it is not always feasible. Penn State, and other institutions like Bucknell, where similar programs are already in place, has a network of faculty and staff whose remit is to support digital scholarship and undertakings of this nature. At other institutions, where faculty may be working without appropriate support from suitably-qualified peers, implementing such an approach might prove to be far more challenging. Having

undergone significant investment in personnel whose mandate was to develop the institution's capacity for digital scholarship, Penn State is in a position to pursue such initiatives. The culture of the departments involved is such that the inherent power differentials in staff and faculty-like employee classifications did not influence the internships–the projects operated as a nearly flat hierarchy, with all faculty, staff, and students contributing as important stakeholders. In a different context, wherein such an initiative might be contained within the hierarchical structures embedded within an institution, one could envision problematic scenarios where student time is prioritised in terms of labour, and dichotomies within employee classifications are reinforced in the minds of emerging scholars. The danger in these models, which involve both intellectual and practical components, is that interns might develop false scholar versus technician personas, based on the perceived roles of contributors. It is imperative to the future of digital scholarship, which has considerable issues around the division and acknowledgement of labour, that artificial power-structures are not reinforced in the minds of the next generation. This extends to both the students [Di Pressi et al. n.d.] and their perceptions of the roles played by all those staff enabling and contributing to the internship. At institutions where faculty-staff classifications exist, measures must be taken to ensure that each partner is encouraged to make a direct contribution to the scholarship's intellectual vision, and that any technical effort is recognized for its inherent value. Administrative support must also be in place, particularly if course credit is going to be one of the motivating factors for students. The geospatial interns had the option of obtaining credit through their respective departments, an option which one of them pursued. While a commitment to alternative modes of learning is present in

particular schools and departments at Penn State, one cannot assume that cultural differences do not exist across disciplines, and that similar administrative support for engaged scholarship would be present across the entire institution. Cost is also a major consideration, particularly here, where the Bednar program allowed us to pay students for their participation in the internships.[7] The likelihood is that most institutions would not be in a position to pay interns, nor would they have the capacity to provide the technology necessary for students to pursue digital modes of scholarship. Unpaid internships might only serve to further the field's current issues with diversity, in that they would be exclusive to those students in the privileged position of not having to consider remuneration when pursuing extracurricular placements. Engaged approaches to teaching digital scholarship provide a mechanism to explore areas of interest in a collaborative and multidisciplinary manner. A digital project requires contact with primary and secondary sources through the lens of digital technologies. By creating opportunities to take an inquiry and explore it in a project environment, interns are learning the importance of understanding how these sources can be negotiated and manipulated through the digital, and what the deep and significant repercussions of this act might be. Given the resources, appropriate planning, and clear objectives and success metrics, we conclude that the internship model can be a highly effective learning experience for students, both to develop their digital literacies and professional skills. With the right guidance and meaningful work, the digital-project-as-pedagogy can be a powerful teaching approach in the digital humanities.

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## Notes

[1] We use the term "digital scholarship" as opposed to "Digital Humanities," as, while we recognize that the latter term is useful in identifying the specific field or community, digital scholarship at Penn State, as at many other institutions, involves collaborators who identify as being from beyond the Humanities, with many hailing from the Social Sciences. But for the purposes of this paper, this is a minute detail, and, functionally, the terms could just as easily be used interchangeably.

[2] For example, many of Penn State’s DH initiatives, and in some cases, faculty appointments, are jointly funded by the University Libraries and the College of the Liberal Arts.

[3] The Pennsylvania State University Libraries has for the last 15 years administered a paid undergraduate internship program that is supported by the generous endowment of donor, Donald W. Hamer, and former employee, Marie Bednar. The endowment is to support and enhance the University Libraries by providing monies for an internship program to enable undergraduates to participate in an active and collaborative learning experience and to gain career experiences in the student’s field of study. Both of the projects outlined in this paper were supported by Bednar funding.

[4] Using the survey detailed in the Student Perspectives section, we give the students an opportunity to reflect on their experience.

However, it would have been ideal if, given a broader scope, they had been given the opportunity to survey their mentors more comprehensively.

[5] Students were aware of the purposes of the survey, and gave permission for their responses to be directly quoted in this paper.

[7] Cost also relates to scale and departmental or school commitment. Success for a digital scholarship internship program might be defined by increased scale, which itself is dependent on the growth in the number of faculty engaged in these approaches and on commitment by college/departmental administrations.

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