Embedding Librarians in Archaeological Field Schools

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ABSTRACT

Participating in an archaeological field school is one of the only educational experiences that nearly all professional archaeologists have during their training. As a result, field schools are uniquely suited to provide experiential education in emerging skills that all archaeologists will need, such as information and data literacies at all stages of the contemporary research and publishing cycle. The "embedded" librarian program in the University of New Brunswick's Downeast Maine Coastal Archaeology Field School is an effective means to deploy that focused expertise to help students better understand the relationship between fieldwork, data, and dissemination. At the same time, being in the field provides librarians with the knowledge to respond more effectively to the complex data management and research needs of archaeologists. We encourage large research projects to consider librarians as specialist members of the research team.

Keywords: embedded librarians, field schools, research data management, digital data

Las escuelas de arqueología en campo son unas de las experiencias educativas en las que participarán casi todos los arqueólogos profesionales durante su formación. Por tal motivo, estas escuelas son particularmente idóneas para proporcionar una educación empírica en las competencias emergentes que necesitarán todos los arqueólogos, como la alfabetización informacional y de datos en todas las fases del ciclo de investigación y publicación contemporáneo. En este artículo describimos un programa bibliotecario "integrado" en la Escuela de Campo de Arqueología Costera de Downeast Maine de la Universidad de New Brunswick. Sugerimos que la integración de bibliotecarios y especialistas en las escuelas de campo arqueológicas es una forma eficaz de utilizar y aprovechar esa experiencia especializada para enseñar a los estudiantes y ayudarles a comprender mejor la relación entre el trabajo de campo, los datos y la divulgación de resultados. De igual forma, la experiencia de campo brinda a los bibliotecarios conocimientos y herramientas para responder de mejor forma a las complejas necesidades de gestión de datos e investigación de los arqueólogos. Por último, animamos a los grandes proyectos de investigación a considerar a los bibliotecarios como miembros especializados en los equipos de investigación.

Palabras clave: bibliotecarios incrustados, escuelas de campo, gestión de datos de investigación, información digital

Archaeologists face an increasingly complex data environment due to evolving technologies and the ongoing digital revolution. Recently, Kansa and Kansa (2021) and Watrall and Goldstein (2022a, 2022b) outlined contemporary challenges facing archaeologists as they collect, curate, and use data. Effectively meeting these challenges will facilitate new analyses and insights, which in turn may refine and inform field data collection in important ways. Because all archaeologists confront the challenges of research data management (RDM) and dissemination—and stand to benefit from mastering them—it is imperative that they are trained in these areas.

Archaeological field schools are the primary way by which students receive field training in archaeology. As Baxter (2009:11) noted, "The archaeological field school is arguably one of the few experiences that unites archaeologists in today's diverse climate of professional practice." A 2015 international survey of archaeologists found that field experience is perceived as the most

"critical skill" for developing a successful career in archaeology (Smith et al. 2015). Faculty, potential employers in cultural resource management, and students all regard field schools as providing training that is essential for a career in archaeology, and field school participation is sometimes analogized as an "apprenticeship" (e.g., Perry 2004).

Archaeological field schools emphasize the acquisition of basic field methods. For instance, the Register of Professional Archaeologists (RPA) codifies the kinds of skills that field school students should learn and practice via its field school certification program (Register of Professional Archaeologists [RPA] 2022). The RPA criteria also underline a reality of fieldwork: archaeological excavation is a destructive process. As a result, archaeological field schools should be part of a defined research program (see Bernandini 2012:40), and the archaeologists directing programs are obligated to responsibly curate the collected data and disseminate results of the research. Field school students take part in
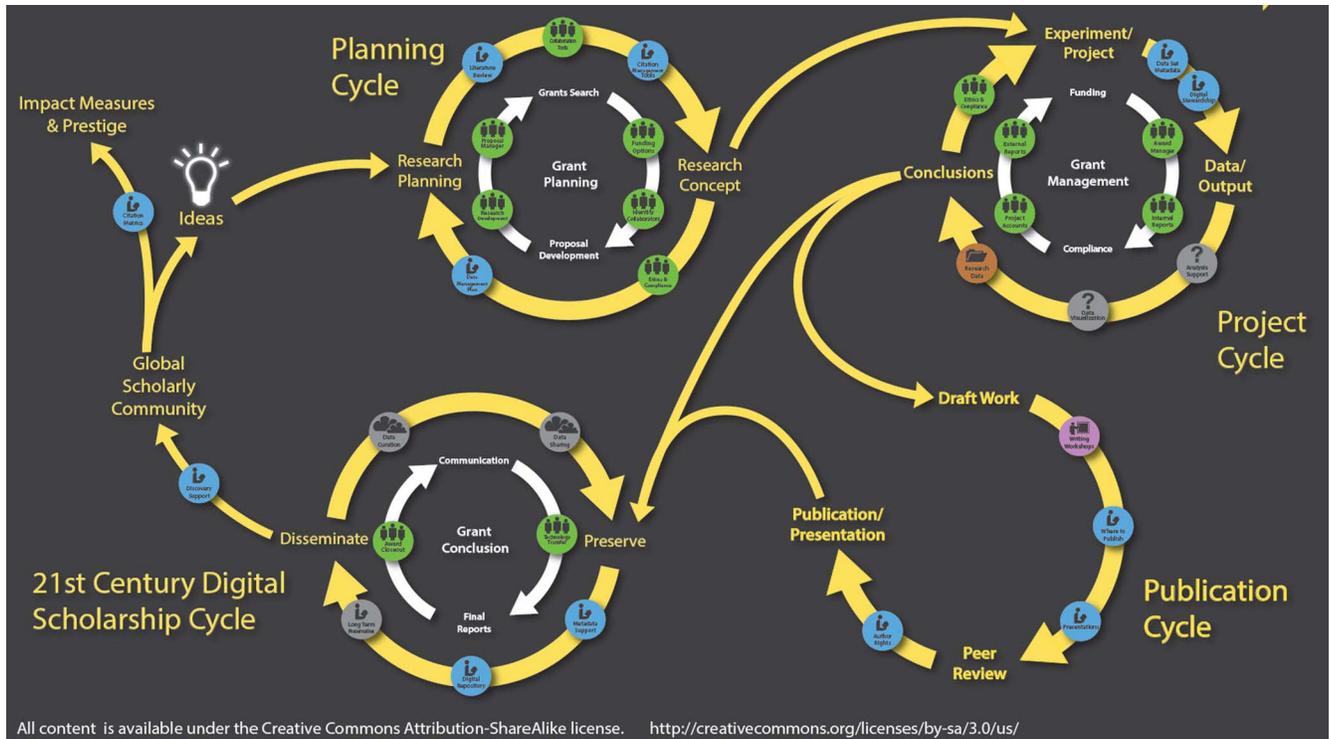
FIGURE 1. Research Life Cycle at University of Central Florida, ver. 2.0. (https://library.ucf.edu/about/departments/scholarly-communication/overview-research-lifecycle/), available via Creative Commons Attribution-ShareAlike license (https://creativecommons.org/licenses/by-sa/3.0/us/). Note: This diagram is useful in a broadly representative way; color coding is irrelevant to the article because it corresponds to a University of Central Florida context.

a research process that includes developing questions, gathering data, and eventually curating, presenting, and publishing results. This aspect of training through active research—essentially a low barrier to entry into doing the real work of archaeology—is widely regarded by students as positive. They see the immediacy of the real work of the discipline as a distinctive feature of archaeology as a field of study. In our experience, field school is often regarded by archaeologists as the time in which they incorporated "archaeologist" into their identities and solidified intentions to be part of the archaeological community.

Although questions of data collection, management, curation, and dissemination have always been crucial in archaeology, archaeologists today work within an elaborate research life cycle comprising smaller but complex and interrelated cycles: grant planning, project administration, traditional publication, and a twenty-first-century digital scholarship cycle that includes data management, curation, dissemination, and preservation (Figure 1). Archaeologists must navigate data and research dissemination within an evolving digital environment, whether in academic or cultural resource management (CRM) contexts (see Bevan 2015; Faniel et al. 2018; Kansa 2012; Kansa and Kansa 2018), and devise ways of teaching these skills to students (e.g., Cook et al. 2018; Gartski 2022).

In this article we describe a pilot program that embeds librarians in an archaeological field school with the goal of better contextualizing archaeological field training within the research cycle.[1] This pilot program extends an ongoing collaboration among

archaeologists and librarians that takes place at the University of North Brunswick and online during the academic year, effectively integrating students, librarians, and archaeologists at all stages of research and teaching. Training provided by the librarians helps students and faculty produce better primary field data and introduces them to the curation and eventual dissemination of data. The field school also increases the capacity for the embedded librarians to tailor instructional, research, and data support to the needs of archaeologists. We describe areas in which university libraries may be particularly well equipped to support archaeological research. In these ventures, we believe librarians should be considered specialist members of an archaeological research team who, like other specialists, should also be engaged with the broader context of research.

THE DOWNEAST MAINE COASTAL ARCHAEOLOGICAL FIELD SCHOOL

The Downeast Maine Coastal Archaeological Field School is an RPA-4 certified field school (RPA 2022) engaged in archaeological research on the coast of Washington County, Maine. It is the teaching program of the Northeastern Archaeological Survey (NAS), based out of the University of New Brunswick, Fredericton (UNB). The NAS is a collaborative field program among researchers based at UNB, the University of New England, the Canadian Museum of History, and the University of Toronto. Our

program focuses on sites that are threatened by coastal erosion and aims to better understand hunter-gatherer cultural changes in the Far Northeast. In addition to being a field program, NAS engages with archival collections that are curated elsewhere. It collaborates with Indigenous communities and community partners such as land trusts, Tribal Historic Preservation Offices, and educational institutions. To date, the project has produced a series of lectures for the general public, as well as presentations, scholarly publications, and theses, many of which used data generated by the field school. We aim for field school students to exceed the core competencies outlined for RPA certification, including procedures for both survey and excavation. We also prioritize engagement with the public to enhance students' communication skills. Field trips, a series of lectures, and hands-on exercises facilitate additional learning. In 2022, 11 students attended the field school.

The NAS continues to record field data primarily via analog methods. All project participants maintain a field journal. Standardized field forms are used for test pits and excavation units and to record features. Profiles are recorded on graph paper. In 2022, we began using Emlid RTK GNSS receivers in the field to record geospatial data directly to a tablet computer, but we continue to use a transit, stadia rod, and tapes to produce maps and site survey data. In short, the workflow is not fully digital, and digitization of field data occurs mostly after the season.

UNB Libraries has resources that are similar to those of other mid-sized comprehensive universities. For our purposes, two programs deserve mention: the liaison librarian program and its Centre for Digital Scholarship.

Liaison librarians provide research assistance, collection development, and co-instruction in and outside the classroom (primarily in information literacy and research methods) to the varied audiences within the university's departments. They also help coordinate access to other specialist librarians and library resources to meet specific instructional or research needs. A liaison librarian is "embedded" (sensu Dewey 2004) for a portion of each semester in the Anthropology Department, spending time in the anthropology building and with the department's students and staff. The value of this approach for students, librarians, and researchers alike was our inspiration for extending librarians' physical presence to the field, which prior to this initiative was the only setting in which students and faculty lacked embedded librarian support. That meant that at the very time when students were most engaged with data and research, they had the least immediate specialist support. By integrating the librarians and their unique expertise into the research and instructional goals of the Anthropology Department, embedding them is expected to facilitate creative and productive collaborations (Dewey 2004; Kesselman and Watstein 2009) and may be seen as an elaboration on the "subject specialist" role of the liaison librarian (Rudasill 2010).

UNB Libraries is also home to the Centre for Digital Scholarship (the Centre). The Centre has a broad purview within the library, with a goal "to increase the impact and durability of UNB-produced research and scholarly resources" (UNB Libraries 2023). In practice, it handles digitization of an extensive array of material, oversight of digital research repositories, and publication support for several Canadian and international research journals. In conjunction with liaison and specialist librarians, the Centre assists researchers and teachers in integrating digital tools into their work. (Such expertise emerging from academic libraries has become especially important in Canada as, e.g., the Tri-Agency of Canadian federal research funding programs phases in its research data management policy.) Each of its functions either articulates or has the potential to integrate with archaeological research. At a practical level, the Centre's equipment—large servers, flatbed scanners, 3D printers, digital cameras, and tools for converting archaic media formats to digital—is useful for generating or maintaining archaeological data. Many larger universities have similar facilities, although often this capacity is decentralized among different units (e.g., archives, maker spaces, digital humanities centers).

EMBEDDING LIBRARIANS IN THE DOWNEAST ARCHAEOLOGY FIELD SCHOOL

Library science literature emphasizes that embedded librarianship moves beyond the physical library itself to deploy library resources and expertise where they are needed and used. Kesselman and Watstein (2009:154) unpack several models and locales: "In academic settings, embedded librarians are in collaborative learning environments. They are on research teams. They are in academic departments. They are co-instructors in the classroom and in the online classroom."

The anthropology liaison librarian and the library's digital imaging coordinator were embedded for one week in the 2022 Downeast Maine Field School: the former to investigate data-related archaeological praxis at an excavation and to instruct on data literacy and curation, and the latter to develop workflows for imaging at the point of excavation and in the field laboratory. Embedding the librarians in the 2022 pilot program served two main goals. The first related to research; the field school provided an environment in which the librarians could deepen their understanding of the work of archaeologists in the field with a view to potential value-adds from the library. The second involved pedagogy; the librarians provided classroom instruction and field-lab demonstrations, and instruction was adapted to reflect the immediate context. We developed the program anticipating (and even welcoming) blurred boundaries between research and instruction. Discussion during the planning stages turned on notions of team, community, collaboration, and timing. We intended the program to allow embedded librarians firsthand to "benefit from learning about the information culture (IC) of the [academic] environment that they want to support" (Deja and Wójcik 2021).

Fundamentally, we considered librarians to be part of the research team. Research partnerships involving faculty–librarian collaboration enjoy a long history across disciplines, but as Janke and Rush (2014) and Foutch (2016) note, until recent years, such arrangements had been informal and underreported in the literature. In contrast, our program is a part of the increasing formalization of "librarian as co-researcher" on project teams to valuable effect (Kellam and Thompson 2016:25–34). As team members at the field school, librarians assumed roles similar to those of specialist archaeologists whose expertise, although narrow, carried over the

length of an entire research project and in the context of the research as a whole.

When considering the broader assemblage of stakeholders at the field school—faculty leaders, visiting scholars and specialists (including librarians), graduate and undergraduate students—we found another helpful frame in the "communities of practice" theory of social learning. First articulated by Lave and Wenger (1991) and later expanded and refined by Wenger (1998), the theory is recognized across disciplines, including in archaeology (see Dissard 2019; Watrall 2019) and librarianship (see Freeman et al. 2022; McCluskey 2013). At their most essential, "communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger-Trayner and Wenger-Trayner 2015). Meaning, significance, and deeper learning arise within a community of practice, predicated on close, regular social interaction. Dissard (2019:4) comments on this phenomenon within archaeology: "Excavations are made up of actions whose significance is constantly being mediated within a group. What archaeologists *do*, in other words, only makes sense when shared with others, to the point that archaeological 'practice' and archaeological 'community' can never be understood separately" (emphasis in original).

The embedded librarians, then, were effectively invited into a community of practice—one whose edges they had already perceived from productive collaborations with archaeologists in a campus setting, but in which participating in the field school allowed them to begin to engage as full participants. First, they spent several days observing and then joining in the routines of the field school. Importantly, this learning (addressing questions such as "What is a site datum? How do you record the plan and elevation of a quadrant?") was often led by the students themselves, reinforcing what they had learned over the previous weeks. The imaging expert also conducted experiments with site photography and photogrammetry. Near the end of the week, the liaison librarian gave a presentation on data, research, and publication cycles; research data management; search and retrieval; and digital cultural heritage curation; this presentation incorporated images, anecdotes, and exchanges from the week. In addition, the imaging expert demonstrated artifact photography and photogrammetry in the field lab. We found that this responsive approach—connecting the library research lessons to specific questions we were actively exploring in the field—motivated student engagement.

Classroom-style instruction by librarians within the field school environment capitalized on the excitement and momentum of the field school experience. Students experiencing this saturation of archaeological experiences were better primed to make connections between immediate problems and questions in the field and the solutions and approaches offered by the librarians, in an approach reminiscent of "just-in-time teaching" in the classroom (Novak et al. 1999). In anecdotal feedback, students indicated that the instruction from librarians also made them reflect on the larger context of the data they were collecting. Although difficult to quantify, we consider this to have improved the coherence and detail of student field notes this season compared to previous seasons.

Our goals were to improve student and faculty understanding of the life cycle and use of archaeological data, increase the quality of data, develop specialized approaches for the curation of data from the project, and explore ways to disseminate the results of the project, especially to the public and descendant communities. We also anticipated that potential collaborations, both generally and specific to the project, might become apparent during extended interaction among archaeologists, librarians, and students in the field.

Our instructional approach emphasized the near-universal experience of an archaeological field school among future professional archaeologists and so focused on research and data management skills and resources that are universally important. The main themes of the 2022 pilot project are described next.

Facilitating and Assisting with Background Research

Agatha Christie Mallowan's (1946:23) account of packing for archaeological fieldwork in the 1930s notes that "one thing can safely be said about archaeological packing. It consists mainly of *books*" (emphasis in original). Although much archaeological source material remains offline, internet connectivity in most field settings permits access to research databases. In the field, librarians can help students identify research resources and better understand the kinds of resources that exist. The field school provides a useful context in which students can apply this knowledge, much as they practice and then apply other archaeological skills.

In the UNB program, librarians introduced contemporary research tools and concepts, such as the ORCID iD program, Portage's Data Management Plan (DMP) Assistant, and the relationship between a repository-stored dataset and its associated publication. Although this sort of training can be done at the university, the universal need of professional archaeologists for these resources makes providing such information in field school a good approach. Valuable experiential context is gained by students and librarians through embedding, leading to a broader scope of understanding and collaboration. The field school provides a shared backdrop and frame in which to ground ancillary skills development: we found that connecting the library research lessons to specific questions we were actively exploring in the field seemed to motivate student engagement. Similarly, the librarians incorporated into their field teaching several research publications from previous NAS activity (including earlier iterations of the field school), helping the students contextualize their work in a longer view.

Research Data Management

Many larger academic libraries have mandates and capacity to facilitate research data management (RDM) at their respective institutions. As already discussed, the Downeast Maine Field School still uses primarily analog data recording, with postprocessing that relies either on scanning or transcribing analog records to create a digital backup that is accessible to the research collaborators. We are actively working to make this process more efficient while not sacrificing the quality of the data we collect nor the simplicity, accessibility, and "future-proof" qualities of analog records. We take steps to ensure that the data we collect and the results of our analyses are safely curated in perpetuity in both digital and analog forms and that our publications and data do not contravene mandates for open-access publishing and digital

data maintenance that are increasingly required by granting agencies, such as the Tri-Agency in Canada. We are also working to make the results of research fully accessible to descendant communities.

Like many archaeologists, we have used "off-the-rack" solutions, such as shared drives and the Digital Archaeological Record (tDAR), a discipline-based repository by Digital Antiquity. UNB librarians have been an invaluable resource for using these resources effectively. tDAR and the UK-based Archaeology Data Service have worked together to produce excellent best practice guides to digital archiving (Archaeology Data Service / Digital Antiquity 2022). While working with museum archives from the mid-twentieth century and reviewing new Canadian Tri-Agency data management guidelines, a recognition of the limited archival training of the archaeologists running the NAS made us keenly aware that experienced specialists would be key to successfully creating the type of digital archive we sought without extensive trial and error.

We are also exploring customized solutions that better meet our own digital data needs and may be used more easily by our collaborators and community partners. Among the motivations for embedding librarians in the field school was to give them the opportunity to participate in archaeological field research and better understand the needs of archaeologists and the life cycle of archaeological data. We have continued working with the librarians to devise data management practices that are relevant to the NAS. For instance, the liaison librarian is investigating the potential (and appropriateness) of the library's Dataverse to help organize field-school–generated data at a considerably earlier stage, before publication. During evening lectures, students were introduced to RDM as a concept: where it fits within publication cycles, the role it plays in funding via data management plans, and how datasets must be maintained through a life cycle.

During the field school, the archaeologists were able to have in-person discussions with the Passamaquoddy Tribal Historic Preservation Officer regarding data management and accessibility to Indigenous communities, helping establish personal relationships that are valuable to collaborations as the project continues. These discussions help localize broader concerns surrounding archaeological data and Indigenous communities that we are working to incorporate into our own research and explore how they articulate with our current data management strategies. These issues include better addressing the FAIR (findable, accessible, interoperable, and reusable) and CARE (collective benefit, authority to control, responsibility, ethics) principles (see, e.g., Gupta et al. 2023; Nicholson et al. 2023). We also hope to explore ways in which Passamaquoddy approaches to ethnographic data, such as the use of traditional knowledge labels (Anderson and Christian 2019), may be extended to archaeological settings. We expect that this collaborative program will expand into a discussion of appropriate digital tools for data management and dissemination (e.g., Gupta et al. 2022).

Data Creation

The Centre provides a variety of imaging tools that are useful for archaeologists, and its staff have the expertise to deploy these tools in the field and offer instruction in using them. These tools, which include high-quality digital photography and computational

photogrammetry of artifacts and features, are being increasingly used in archaeological field and laboratory settings. Librarians offered instruction in these methods both in the field and in the field laboratory (Figure 2). In addition to the training opportunities, specialist use of this equipment generated images and records of excellent quality, and librarians became more familiar with the imaging needs of archaeologists and of the specific project. This work, as anticipated, carried into postprocessing and refinements conducted after the field school ended. For example, the imaging specialist was able to more readily understand the level of detail required to enable the appropriate analysis of ceramic decoration, leading him to explore the use of focus-stacking techniques. Focus stacking, applied to a set of images for 3D rendering, allows the capture of a significantly finer level of detail (Ravanelli et al. 2022). On the technical side, the imaging specialist discovered that 45 photographs per artifact is the ideal number to achieve better 3D renderings (Ge et al. 2022). He also appreciated more the challenges in digitizing multifaceted artifacts that require multiple camera positions on the vertical axis. Although these realizations may seem mundane, they emphasize the need for firsthand experience in applying general techniques to specific cases.

In the liaison librarian's presentation, students were shown applications of ancillary archaeological data creation that the librarian had prepared ahead of time. Weeks before the field school started, the imaging expert, liaison librarian, and a graduate student in UNB Anthropology had selected an artifact from a past iteration of the field school. Working in the Fabrication Laboratory of the UNB Libraries Research Commons, they then created high-quality 2D reference images and a 3D rendering (.stl file); the latter was converted to G-code and 3D printed, providing an excellent visual aid.

Publication and Data Dissemination

During the presentation, the liaison librarian spent time unpacking several parts of the research life cycle related to data curation and dissemination, RDM, and formal publication, with some mention of library involvement in other aspects, such as citation management, rights tracking, grant support, and preservation. The students were shown examples of publications that came directly from previous iterations of their field school, of the datasets associated with those publications, and the corresponding records in repositories like tDAR that explicitly linked the two.

Although most field school students are not yet preparing papers for publication, those who go on to professional careers should publish their work; therefore, we believe that publication is an essential topic for future archaeologists. They must grapple not only with the reality that data have become primarily digital but also with the rapidly evolving world of academic publishing. Librarians have expertise in topics such as open-access publishing, copyright, article processing charges, journal impact, and predatory journals and can help demystify them for students and faculty. These concerns are universal for archaeologists because of ethical obligations surrounding intellectual property and the obligation to publish or otherwise distribute research (e.g., Society for American Archaeology 2016).

The digital revolution has also produced a variety of tools archaeologists can use to disseminate the results of their research

FIGURE 2. Librarians developing protocols for artifact photographs and photogrammetry and devising an improvised instructional space. (Photo by Tammy Nichol.)

to the public, and librarians can help them navigate both practical and philosophical concerns surrounding them. For instance, we have begun to consider ways to create an online exhibit about the field school research. One platform identified by the librarians for that purpose is Omeka (omeka.org), an open-source content management system for creating and curating digital collections. In addition to the usual academic demands of producing accurate and accessible information for public audiences, there are archaeological questions about the dissemination of information from archaeological sites, ranging from how much to conceal site location data to the appropriateness of openly sharing Indigenous cultural patrimony. As data and information specialists, librarians can help archaeologists navigate these issues and identify tools that can be implemented to facilitate solutions. In at least one instance, a student who had been involved with librarians in the

field sought out more in-depth library services to support her academic experience in new ways and explicitly related this to her field experience. In the future, we plan to implement some of the digital strategies we discussed this year, and we anticipate opportunities for students to work on and with digital displays for the public. This is, in effect, a twenty-first-century version of the field school requirements that each student engages with questions from the public and takes a member of the public on at least one site tour.

DISCUSSION

Archaeologists are increasingly aware of the need for more training in data production and management, and our project builds

on this extensive and growing literature (see, e.g., Bevan 2015; Gartski 2022; Kansa 2012; Kansa and Kansa 2018, 2021; Richardson 2013; Watrall 2019). We believe that our pilot program of embedding librarians in archaeological field schools will improve both the educational and research missions of the NAS. Clearly, librarians have expertise that is relevant to archaeologists. Embedded librarianship and field schools are philosophically aligned in that both emphasize collaboration toward a common goal and involve teamwork (Shumaker and Makins 2012). An archaeological field school is one of the few educational experiences shared by nearly all professional archaeologists; it therefore offers an ideal opportunity for the provision of basic instruction in crucial skills that are needed across archaeological subspecialties and regions and are relevant to academic and CRM archaeologists alike. Additionally, students entering the workforce with experience navigating these issues as part of their field school experience may possess skills and solutions that their more senior colleagues may not have. We therefore intend to expand and develop our program of embedding librarians in our field school.

This program also yielded valuable technical insights that may be project specific, and we think it is valuable to allow multiple days for trial and error. Crucially, a long-term engagement between librarians and archaeologists permits improvements in data creation and management from season to season. For example, we identified project-specific benefits for applying photogrammetry in the field. Additionally, the imaging specialist learned valuable lessons-of-omission to incorporate in future field school involvement—such as the importance of a temporary shelter to house the field lab in a bright but damp coastal environment, the necessity of a high-end macro lens for increased textural detail in 3D renderings of smaller artifacts, and the requirement for a randomly patterned surface on the photographic turntable to assist photogrammetry software in image alignment. Many of these practical concerns are understood generally but are best applied with specific field conditions in mind. We included these new understandings in our most recent grant applications.

Embedded librarianship also has the potential to improve the quality of research data and research data management and dissemination. The digital data revolution has tremendous potential to address major research questions (see Holdaway et al. 2019) and improve access to archaeological research (see Richardson 2013). We view the embedded librarian program as a step toward a model in which librarians have roles like archaeological specialists, engaged in research and instruction from the point of project conception through to publication and data curation.

Kansa and Kansa (2021:82) emphasize the need for all members of a research team to be concerned with data management, in part to distribute responsibility away from a single data manager whose engagement with a project may be temporary. Models of data management that use robust institutional resources such as academic libraries rather than soft-money positions with frequent turnover may provide more continuity in data management (Kansa and Kansa 2021:82). Properly conceived, data management must extend beyond the life of a project or even the life of an individual scholar. An approach that emphasizes active library involvement builds on the expertise and specialized facilities that ours and many other universities already have and maintain. One challenge to programs like the one we outlined here may be ensuring that fieldwork and data management align with the criteria for evaluation of librarians at university libraries. When appropriate, substantial contributions of librarians should also be recognized with coauthorships—as in this article—and in other quantifiable ways.

CONCLUSION

In a rapidly evolving and increasingly complex archaeological data environment, librarians are valuable as specialist coresearchers on archaeological projects, lending expertise to data creation, curation, and dissemination. We suggest moving toward a model of archaeological fieldwork that regards librarians or archivists as subspecialists and members of an archaeological research team and to budget for this in grant proposals. Including librarians in archaeological fieldwork offers similar advantages to including other subspecialists: they can offer guidance about data collection and management at the point of collection and gain a holistic perspective of a field research project to help tailor curation and improve research.

Including librarians in field schools takes advantage of the field school as an effectively universal experience among professional archaeologists to introduce essential archaeological skills. Research, data creation, data management, and publication are such skills. Much like project zooarchaeologists, archaeobotanists, and other specialists provide introductory hands-on teaching in the field as members of a research team, field schools offer an opportunity for librarians and archivists to instruct students in basic but essential skills for archaeological research. We would encourage other field schools to work with their university librarians from project conception to completion and consider embedding them in field projects.

Data Availability Statement

Original data were not used in the preparation of this article.

Competing Interests

The authors declare none.

NOTE

1. We use "librarians" here as a shorthand for professional librarians and adjacent experts—library staff, or even specialists outside the library,

depending on institutional arrangement, when expertise is germane (e.g., research data managers, archivists, or imaging specialists from non-library units on a campus).

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