FEATURE: REPORTS FROM THE FIELD

Engagement Scenarios for Tomorrow's Library Labs

Katy Webb and Laurents Sesink

abstract: Library labs are dedicated spaces with highly trained library, IT, and research support staff. The staff are on hand to help teach faculty and advanced graduate students new and emerging methodologies and technologies. Such a lab is a place to engage in new ways of, for example, doing digital scholarship or putting Open Science into practice. This article looks at ways that researchers engage with library labs and proposes a lab engagement pyramid to distinguish models for deploying trained staff and resources within the library lab space. A lab in an academic library requires the right mindset, skill set, tool set, programs, and staffing. The authors posit that a lab will be most successful if the library identifies the conditions that are desirable for the proposed lab space before it is designed and built. When a lab is already in existence but is underutilized, changing engagement strategies can lead to new growth.

Introduction

Library labs have opened with great fanfare to offer new technology-enabled spaces in academic libraries across the world. Such labs offer much more than the traditional computer labs where students log in to terminals to use word processing software to write an essay. Library labs are dedicated spaces with highly trained library, IT, and research support staff. The staff are on hand to help teach faculty and graduate students new and emerging methodologies and technologies, which will enable them to be prepared for current research trends. Many times, the library is selected as a location for a lab because it is already the place where

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scholarly and primary source material is kept, and it serves as an established meeting place for professors, researchers, and graduate students. Some universities put a lab in the library rather than in a faculty or departmental building, where a specific discipline or group of researchers might seem to have ownership or preference. The library also

offers expert help, with specialists on hand to work alongside researchers to instruct them on new tools and methods.

Many labs in libraries today offer places for presentation and working collaboratively, but what makes these spaces different from a classroom, office, help desk, computer room, or communal workspace? The academic world has increasingly moved to wider participation and collaboration in scientific research, as shown by the trends of Open Science, team science, and citizen science. Open Science, for example, is the practice of science so that research findings, lab notes, and other research outputs are freely available for all to use. The democratization of the research process brings together people with varying skill sets and areas of knowledge to tackle big problems. With the right engagement strategies, the library, and the labs within them, can assist with skill acquisition for advanced technology and methods.

Digital Scholarship and Open Science

Two recent trends in research have been important drivers for the library lab: digital scholarship and Open Science. Digital scholarship comprises the many ways in which researchers make use of digital technologies for academic research. Digital data have become available in ever-growing quantities. Simultaneously, the methods, techniques, and instruments used to analyze and visualize these data have become more and more sophisticated. The new scientific and scholarly approaches that are emerging increasingly rely on the large, complex datasets that comprise "big data" and on interdisciplinary collaboration. Studies at the forefront of these changes often require new methods, new techniques, or new instruments.

Another area important to the academy where researchers need support as they collaborate is Open Science. The transition to Open Science is underway nationally and internationally. Research institutions, research funders, libraries, researchers, and research support organizations are committed to making science more open, transparent, and inclusive. UNESCO posits that Open Science is a human right, as it allows everyone to share in the scientific process and its benefits. For the European Commission, Open Science is a policy priority and standard operating procedure under its research and innovation funding programs. The United States government has also taken steps to advance the principles of open research. A 2022 memo from the Office of Science and Technology Policy laid out plans for all federal agencies with research and development funding to make their publications and supporting data open by 2025.[1] These plans will impact any researcher with a grant from a federal source in the United States.

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To strengthen the foundation for a future of Open Science, federal agencies celebrated a Year of Open Science in 2023. The year's events and activities aimed to spark culture change, strengthen infrastructures and policies, build capacity, recognize and celebrate Open Science contributions, and inspire engagement.

To fully exploit the possibilities and limitations of the many different aspects of digital scholarship and Open Science, researchers need the appropriate skills and expertise and access to advanced methods and techniques. Other necessities include the ability to collaborate with other researchers (potentially from other disciplines) and support from experts who can guide, facilitate, and train the researchers. Furthermore, to apply Open Science principles, researchers need to experiment with research infrastructures and engage with Open Science practices. Library labs are a strategic investment in technology and support that many universities are building to provide researchers a physical place to engage directly with expert staff.

The Potential of Library Labs

As Micah Vandegrift and Stewart Varner state, a library "must increasingly function as a place where scholars can try new things, explore new methodologies and generally experiment with new ways of doing scholarship."[2] A lab could be considered as a place to engage in these new ways of scholarship. This prompts the question: during the design of a lab, what can help ensure that researchers will come to the lab once it is built? In a presentation to the Association of College and Research Libraries in 2015, Elliot Felix, the founder and CEO of brightspot strategy, an architectural consultant for universities and libraries, listed some requirements. The ideal creative space in an academic library setting, Felix said, must offer the right mindset, skill set, tool set, programs, and staffing, as well as spaces and settings in harmony.[3]

What do people do in a library lab, and how do they engage with staff and other researchers? What activities happen in existing library labs, and how can they evolve? This article endeavors to answer these questions, as well as to provide examples of engagement strategies to show how existing library labs might change course for growth.

Key Drivers for Library Labs

Some broad developments in our global culture and within the academy have created an environment that calls for the creation of nonscientific labs within libraries. As the production of knowledge has become increasingly digital, libraries have grappled with the demand of students and researchers for increasing amounts of digital data, as well as analysis and manipulation of those data. This trend of digitalization has led increasing numbers of people to become authors of digital media. In turn, the creation of labs to facilitate and study these activities supports the production of knowledge within the academy.

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The influx of digital data makes possible the large-scale application of new methods and techniques. Digital humanities (DH) labs are a good example of library labs that have shifted their focus to support new methods of using large corpora of language data. Data science and artificial intelligence are increasingly applied in all scientific disciplines. To use these new

methods and techniques, researchers must be supported. Libraries have long served as an interdisciplinary hub on campus, making them an ideal location for a lab to serve researchers as they address multidisciplinary research challenges.

Types of Library Labs

The authors have conducted site visits, interviewed lab personnel, and reviewed labs online. This research has enabled us to identify seven broad types of library labs with different engagement strategies:

- Lab as display for research: An open area, usually in a highly trafficked section of the library, with displays showing how to do digital scholarship or exhibiting products of digital research.
- Lab as classroom: A technology-enabled classroom with hybrid meeting technology set aside specifically for the instruction of digital scholarship methodology.
- Lab as technology depot: Multiple small rooms or one large room with specialized technology, for example, virtual reality or 3D printers.
- Lab as central location for expert help: A space that offers help from specialized staff, usually with office hours for walk-ins and a workshop series.
- Lab as researcher collective: Some libraries call their digital humanities, data, or scholars' research group a lab but lack a physical location for their activities. A lab as researcher collective may set aside space for the group to meet or have a long-term project space.
- Lab as community or thematic hub: A space where people meet to collaborate, either with an expert or in small groups via a community of practice, focused on a specific topic.
- Lab as studio: A space that encourages active experimentation, prototyping, and even failure with new concepts and ideas.

These types of labs can be arranged on a lab engagement and skills pyramid (see Figure 1). Arrows on either side of the pyramid show the amount of specialized staff and the level of engagement and development needed for each type. Looking at the types of library lab on the pyramid, one can see that the increasing levels of engagement take more energy to sustain, with a lab as studio taking the most engagement and development.

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This section talks about different methods for engagement in library labs supporting digital scholarship, again by looking at each of the types. The ideal number of staff members for a library lab will depend on the budget, the needs of those who use the lab, and the overall size of the library and university. Even without considering the exact services or technology tools that are supported, it is possible to consider the staff duties and the kind of skills they will need to support a lab.

Lab as Display for Research

A lab as display for research is an open area, usually in a highly visible area of the library, with displays showing how to do digital scholarship or exhibiting products of digital
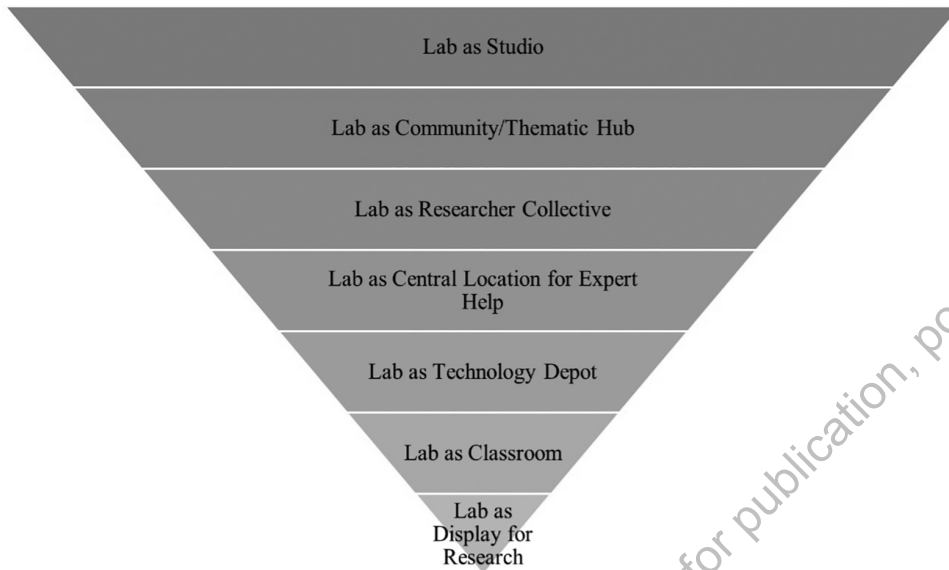
Figure 1. The types of library labs can be arranged on a lab engagement and skills pyramid according to what they require to operate. The arrow on the left shows the engagement and development called for, while that on the right indicates the level of skilled staff needed. A lab as studio takes the most engagement and the most staff, while a lab as display for research requires the least of both.

research. An example of this model would be the James B. Hunt Jr. Library at North Carolina State University in Raleigh. In the library's iPearl Immersion Theater, interactive walls display visualized data.[4] A lab as display for research normally functions as a self-service exhibit where dedicated staff need not be present throughout the workday. That said, staff time and an engagement strategy are required. Depending on the level of expertise needed to develop the displays, a committee or exhibits group can work to keep them fresh and inviting. If a display is technology-enabled, the staff may need IT skills. Staff in a display for research will also need ability in marketing, social media, and possibly publishing. Outreach to groups who may wish to display their research and buy-in for the lab are also required.

Lab as Classroom

A lab as classroom is a technology-enabled classroom, or grouping of classrooms, with hybrid meeting technology set aside specifically for the instruction of digital scholarship methodology. An example of this model is the Digital Humanities Workspace at Utrecht University in the Netherlands. It includes high-tech spaces for the teaching of new and emerging digital humanities and digital scholarship techniques.[5] In a lab as classroom, staff need to help keep the technology functional, but it may be possible to outsource this duty to campus IT. For this type of lab, the main needs are instructors for a workshop series. In some instances, a lab as classroom may be used by faculty members who teach full-length courses. Skills needed by staff will include IT troubleshooting, knowing the landscape of campus support and academic services, and monitoring and scheduling the space.

Lab as Technology Depot

A lab as technology depot consists of multiple small rooms or one large room with specialized equipment, usually including emerging technologies such as virtual reality (VR) and augmented reality (AR). An example of this model is the Atomic Object Technology Showcase at the Mary Idema Pew Library at Grand Valley State University in Allendale, Michigan,[6] but many other labs work under this model. The needs to operate a lab as technology depot increase significantly when specialized hardware and software come into play. Staff must not only keep advanced technology running but also teach people how to use the equipment. Again, marketing will be important, as it is necessary to let the campus community know what is available in the lab. Lastly, it will be a key duty for someone in the lab to monitor trends and learn about new digital scholarship tools and methods.

Lab as Central Location for Expert Help

A lab as central location for expert help offers assistance, usually with office hours for walk-ins and a workshop series. The Centre for Digital Scholarship at the University of Leiden in the Netherlands is an example of an emerging lab that follows this model.[7] When talking about a lab as central location for expert help, it is important to note that the experts might not be library staff. Many libraries recruit specialists from outside the library to work within the lab. People may come for advice on methods or tools, or they may want to learn more about publishing and copyright. Many operational questions will need

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to be answered. Will the help be walk-in or scheduled? Will remote services be offered? What other services on campus could be moved to the lab for it to become known as the central location to receive assistance? Programming in such a lab might include special workshops, a speaker series, or office hours with dedicated staff to answer questions.

Lab as Researcher Collective

Researcher collectives, also known as communities of practice, are groups of practitioners and researchers who "share a concern or a passion for something they do and learn how to do it better as they interact regularly."[8] In a lab as researcher collective, the lab may or may not have a physical location for activities. A space may be set aside for the collective to meet or have a long-term project space. Different groups of researchers will come together to share their experiences with digital tools, methodologies, and techniques, and they may come from disparate areas of campus. They often work on separate research topics but come together for support and learning and to share information

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about their research. The University of Wisconsin-Milwaukee's Digital Humanities Lab is an example of a space that functions as a lab as researcher collective.[9] Anthropologists Etienne Wenger-Trayner and Beverly Wenger-Trayner cite the following activities for communities of practice: problem solving, request for information, seeking experience, reusing assets, coordination and synergy, building an argument, discussing new developments, documenting projects, visits, and identifying gaps in competence.[10] In their article about participatory networks, R. David Lankes, Joanne Silverstein, and Scott Nicholson encourage those working in libraries to reframe themselves as part of the conversation of research, active participants in the advances taking place as they interact with collections and services within the library.[11]

The library's staffing needs for a lab as a researcher collective may be minimal, depending on how the collective is run. Most of the work tends to be administrative, such as setting up meetings and making sure that the collective has what it needs to operate. Assessment and user experience skills could be helpful in determining how to best support these groups. As in a lab as central location for expert help, library staff may also need to provide expert assistance for these researchers. It will be important to conduct outreach to get people to come and join in. Staff may act as moderators of meetings for the community of practice to ensure continuity, especially after key members move on. Instructional skills are important for teaching workshops, and grant-writing skills may be sought out by researchers or to support the lab.

Lab as Community or Thematic Hub

In a lab as community or thematic hub, people come together to collaborate on a specific topic, either with an expert or in small groups via a community of practice. This topic will be one that is important to the mission and vision of the university, and many researchers from different disciplines may come together to discuss it. Because a lab as community or thematic hub requires administrative buy-in and a view of the big picture of the university's strategic direction, it will be important for the lab to have a director. This model requires staff to have more

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knowledge of a subject area or to be researchers themselves, depending on the theme chosen. Event planning, marketing, and instructional skills will be important for staff in a thematic hub, as well. An example of a thematic hub is the Sustainability Studio at Carnegie Mellon University in Pittsburgh.[12]

Labs can focus on a variety of topics that can be tailor fit to the campus environment. Brian Mathews discusses many of the components of learning environments in his book chapter in *Designing Libraries for the 21st Century*. They include:

- Data, computational thinking, systems thinking, and interconnectedness
- Social, civil, and civic engagement, change-making, and inclusivity
- Design a better world, sustainable futures, and global impact.

- Learning, achieving, and academic success.
- Well-being, mental health, concentration, and contemplation
- Service, volunteering, acts of compassion, and community building
- Tinkering, experimentation, do it yourself (DIY), and maker ethos.[13]

By pairing themes with the needs of the students, professors, and the campus community, the library lab can become a hub for activity around a theme that is driving research.

Lab as Studio

Library labs should be places of experimentation where researchers can try out new things, collaborate with other researchers and expert staff, and perhaps even experi-

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ence failure. Therefore, the top of the pyramid, a lab as studio, encourages people to take part in active experimentation and prototyping with new concepts and ideas. In her book chapter, Samantha Guss outlines her vision for academic data services within a studio model. Guss posits that a studio is a place for creating, for learning through iteration, and for self-directed work, and it is often formulated as a collective.[14] This collective is not only sharing resources, such as tools, but also shares knowledge so that people can cooperate and learn from one another. The library labs that espouse this studio culture create a rich and welcoming environment for researchers to come in and try things. Amy Jackson, Cindy Pierard, and Suzanne Schadl posit that research is

> a social and experiential craft. The library as laboratory supports this practice through makerspaces, exhibition areas, lecture spaces, digital design studios, large-scale visualizations, and collaborative learning spaces. The idea of a lab also transcends the characteristics of a physical space or a set of tools to encourage an ethos of exploration and experimentation.[15]

Staff in a lab as studio must have a bit of all the characteristics mentioned already, since the lab may combine many of the attributes of the types of lab described earlier. Special training in design thinking, such as that offered by the design and consulting firm IDEO, can be helpful for staff.[16] Staff in a lab as studio may become embedded in academic courses or activities, or they may create their own degree programs. They may support grant activities, too. A lab as studio requires staff who are willing to try new things, to get the lab messy, and to include new groups in the fun. Though lab as studio sits atop the engagement and skills pyramid, not all labs will find it desirable or possible to operate in this way, as achieving it takes a considerable amount of engagement, staff expertise, and time.

Human Capacity

In his presentation at the 2023 Designing Libraries conference, Greg Raschke, senior vice provost and director of libraries at North Carolina State University in Raleigh, made the

case that "labor is the secret sauce" of the library lab.[17] Simply getting people to come into a library lab and staffing the programs that are offered takes human labor. Raschke went on to say that getting the space designed and the doors opened was the easy part, and just the beginning. The library lab cannot exist without partnerships with faculty, programming to get people interested, workshops, and direct engagement with students and community members. It is not enough to build a lab in a library and expect people to come.

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Staffing is important. Though a new lab might open with a small staff due to budget constraints, institutions should have a plan for building their staff over time to allow for growth in the programs they offer. Having additional staff also allows people to specialize. Many digital humanities labs, for example, have a program manager who conducts outreach, works to build the program, sets the strategy, and works with administrators. The lab may also have a technology-focused position that helps to build databases, websites, and new DH projects. This position, or a teaching-focused staff member, will instruct faculty and students on new methods and techniques. Some labs also employ graduate or undergraduate student staff to cover some of these duties, rather than having full-time staff. Attributes for which to hire staff include:

- Teaching or training skills
- Soft skills, such as a willingness to talk to people, emotional intelligence, and patience
- Strategic planning
- Marketing skills, such as creating flyers, websites, or social media posts
- Event planning and logistics
- A curiosity about technology that would encourage learning about new and emerging tools
- Technology skills, though these skills should not be the only thing highly prized in a lab employee. With interest and time, many people can learn the methods and tools needed for a library lab.

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The highest aim of the library lab is to welcome people, make them feel comfortable, and assist them in getting started with a project. It is important to meet people where they are, knowing that they may take some time in learning what they came to discover.

Choosing an Engagement Strategy

Put simply, it is not enough to build a lab and expect the researchers to flock to your door. Creating the right mixture of attributes and encouraging people, as digital humanities researcher Stephen Ramsay puts it, to "screw around" will create a library space that

researchers will want to use.[18] As Patrik Svensson states in his book chapter, "Contemporary and Future Spaces for Media Studies and Digital Humanities":

> Designing and building spaces is always an iterative process and does not start out wholly from either the conceptual or material level. Anyone who has designed an institutional space will know that such processes are dependent on operational and conceptual ideas, stakeholders and users, available resources, existing physical structures, institutional protocols, and many different types of professional expertise. Much of the work is about negotiation, but without a basic idea and concept (that is likely to develop through the process) a very crucial part is missing.[19]

Svensson goes on to say that lab building projects end up less successful when the "operation in question . . . does not have an articulated set of ideas about what they want to be and become (conceptual foundation)."[20] Instead of asking how to achieve a lab as studio, ask instead, what are your ambitions, what resources do you have, and who will you need to partner with?

Many of the library spaces designated as labs sit unused. In these cases, it is important to investigate why the lab is underutilized. Researcher habits can be hard to predict, so a thoughtful approach to a redesign may be needed. Consider your strategy and reassess. Has a lower level type of library lab from the engagement pyramid been applied, leaving researchers uninterested or seeking help elsewhere? Is there a mismatch in the type or amount of lab support offered by staff? Another possibility is that the engagement strategy is inappropriate for researchers' needs or the campus culture. In this section, we provide options for changing course through some observed trends in library labs.

Specialize

One method to reenergize a lab is to specialize to follow a trend on campus. This moves the engagement strategy from a lower level on the engagement pyramid and into that of a lab as community or thematic hub. Some examples of trends that libraries might follow are artificial intelligence, virtual reality, or 3D printing.

There are some challenging questions with this approach. Do you let campus lead you, effectively turning the lab over to the practitioners in this area, or do you have a resident expert in the library? Will this effort require a major investment in technology, and who should pay for it? What happens when this trend is no longer of interest to researchers, instructors, or students? What happens if your resident expert leaves the library or the university?

An example of a library committed to a specialized topic is the library of Brandeis University in Waltham, Massachusetts. The Brandeis Research Technology and Innovation department manages the three makerspaces in the Brandeis Library system: the MakerLab, the Automation Lab, and the Digital Humanities Lab.[21] This extensive program is the vision of an expert in the library (also a faculty member), who has helped to invest heavily into 3D printing and have it integrated with the curriculum of the school. Another library that has focused on a theme and built on the idea of a lab as community or thematic hub is the Sustainability Studio at Carnegie-Mellon University's Hunt Library. The lab supports a campus-wide sustainability initiative that spans fields of study.[22]

Reorganize

Some libraries rearrange their organizational structure to combine labs. Data labs, global information science (GIS) labs, DH labs, and more may be brought under one umbrella. There are financial and administrative benefits, as multiple labs can operate under one

leadership structure, while spaces that have not been well-provisioned or used can be closed. The format for engagement for these different types of labs is similar, with office hours, scheduled programming, and expert staff. For some larger libraries, this may be an opportunity for renaming and reenergizing a program. The merger also

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may allow the combined staff to offer a more robust set of services and thus change their engagement strategy by pooling resources. Another benefit may be that with streamlined request processes, users of the service can engage with expert help without feeling bounced around.

Two elite universities, Yale and Stanford, are working to bring digital research services under one umbrella within the library. For both, this will impact the DH lab, GIS services, and data services. At Stanford, the new program will be called the Center for Interdisciplinary Digital Research, and at Yale it will be the department of Computational Methods and Research Data.[23]

Build Capacity with Undergraduates

Some universities and libraries engage undergraduates in digital research methods by introducing digital tools and concepts early in their careers as students. Many graduate students and some post-doctoral fellows say they wish they had been introduced sooner to digital humanities, data, and other methods. Some universities introduce media literacy concepts in undergraduate courses. The concept of badging, where students work through learning modules to prove their knowledge of new concepts, has been applied to digital humanities, media literacy, and software applications such as Adobe Creative Suite. Libraries engage with undergraduate courses to produce projects that are less extensive versions of DH activities. Lastly, contests can be a way to engage students, but with a lower barrier for entry than the production of a DH or digital scholarship research project. Many of these individual engagement strategies build interest in the digital scholarship services within the lab and allow a greater number of people to use the lab.

The University of North Carolina at Chapel Hill (UNC-CH) is an example of a university that has focused on digital literacy at all levels. The university has engaged with undergraduates by reworking the first-year writing seminars to include other types of creation and writing, including software apps, marketing materials, and websites.[24] Many of these projects were built through a partnership with Adobe Creative Campus and a strong advocate in the First Year Writing Program. These projects are not traditional DH projects but build concept knowledge for advanced work later. The English program also has a Composition, Rhetoric, and Digital Literacy minor for undergraduates. UNC-CH has a badging initiative tied to the DH innovation lab that includes three badges, two

for graduate students and one for undergraduates.[25] The badges are called the digital pedagogy badge, digital project management, and data studies. For labs looking to engage with undergraduates, it is possible to partner or host these activities within the lab.

Conduct Outreach and Find Partners

A method for building the capacity and engagement with a lab is to conduct outreach and find partners with new degree programs. Some libraries collaborate with researchers to develop a new graduate certificate or an undergraduate minor. They may hire visiting or fixed-term lecturers who have partial responsibility to help generate outreach and programming for the lab. This effort can help set up the library lab as either the central location for expert help or as a community or thematic hub. Incentive grant programs can be developed to support and draw faculty as they learn new tools or integrate digital scholarship into their curriculum.

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An example of this method of engagement is Washington and Lee University in Lexington, Virginia.[26] The university has received multiple Mellon Foundation grants. It has an innovative format to include one-credit DH studio courses that are corequisites to full-credit humanities and social sciences courses. Washington and Lee also offers a minor in digital culture and information. Its four-week intensive spring courses use graduate students as teaching assistants, and student teams get funding to attend DH conferences and workshops. Lastly, the university has a DH incentive grant program to assist faculty with integrating DH into their courses. Washington and Lee has an Innovation Lab in their library for students working on DH projects.

Conclusion

This paper has investigated the drivers in the academy and broader culture that have led to the boom in library labs being built in academic libraries. We have looked at ways that researchers engage with library labs and proposed a lab engagement pyramid to distinguish models for deploying trained staff and resources within the library lab space. In this article, the authors posit that lab spaces will be most successful if the library can identify the different types of engagement that best fit the goals for the proposed lab before it is designed and built. While labs need not aspire immediately to the highest levels of engagement, labs that focus on just one goal or only on the lower levels of the pyramid tend to attract fewer attendees and receive only limited engagement. The ideal engagement strategy will vary based on the needs of local stakeholders and the resources and staffing available. A lab that fails to generate desired levels of engagement might be revitalized by identifying the needs of the intended audience and deploying resources and expertise accordingly.

Extensive research is needed to discover the mission and vision of a library lab. Planning one requires understanding the needs of stakeholders as well as how the lab

dovetails with and builds upon the mission and vision of the university. Although library labs are spaces, it is more important to think of them as strategies for directing resources

and personnel to address inter-disciplinary or multidisciplinary research challenges. Among the challenges are Open Science, digital scholarship, and responsible use of new methodologies and techniques like artificial intelligence. Increasingly, these rapidly evolving challenges are digital in nature, so appropriate technology

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and expertise are essential. For this reason, it is necessary to spend time discovering the needs of researchers through targeted feedback sessions and to carefully consider the appropriate engagement strategy before building a lab.

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Notes

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