Introduction

Sue Baughman, Deputy Executive Director, Association of Research Libraries

The debate over the meaning of the term "digital humanities" has taken place as long as the field of humanities computing has been evolving in the production, curation, and interaction with knowledge that is born digital. Journals and associations are dedicated to the topic and study of digital humanities. Research centers at a number of academic institutions support research agendas around digital tools, text mining and visualization, and the creation and preservation of electronic literature. Colleges of information studies are creating curricula that teach librarians the skills needed to participate in digital humanities research activities. Libraries are creating positions in this area as they build new initiatives and partnerships for humanistic research and teaching.

To lend clarity to the topic, Donald J. Waters, program officer for scholarly communications and information technology at the Andrew W. Mellon Foundation, has built on a presentation given at ARL's May 2013 Membership Meeting, and graciously agreed to publish his paper in *Research Library Issues*.

His treatise, "An Overview of the Digital Humanities," encourages readers to consider the defining feature of the digital humanities as the "application of digital resources and methods to humanistic inquiry." Waters questions why digital humanities require a "special marker" or special attention when other forms of humanistic inquiry do not. Through examples he shares his observations about the future trajectory of the digital humanities and investments that universities and libraries might consider.

Readers might also find two other ARL publications helpful:

- *Digital Humanities*, SPEC Kit 326 (November 2011), by Tim Bryson, Miriam Posner, Alain St. Pierre, and Stewart Varner, http://publications.arl.org/Digital-Humanities-SPEC-Kit-326/

- *New Roles for New Times: Transforming Liaison Roles in Research Libraries* (August 2013), by Janice M. Jaguszewski and Karen Williams, http://www.arl.org/nrnt-liaisons

As the digital humanities are capturing the virtual space of humanistic inquiry, library physical spaces are capturing the interests of incoming students and are incubating learning for future scholars and scientists.

Spaces as they are tied to library roles, collections, and services are of great interest to libraries. As roles, collections, and services have changed, the configuration of library space has evolved to more effectively meet these needs. New and different types of spaces are becoming more prevalent in libraries and new

and different campus partnerships have been created. The second article in this issue, "Library Space Assessment: Focusing on Learning," discusses the analysis of library space and its critical connection to student learning. Joan K. Lippincott, associate executive director at the Coalition for Networked Information, and Kim Duckett, associate head of digital technologies and learning in Research and Information Services at North Carolina State University Libraries, show the importance of collecting meaningful data that supports the creation of new or renovated learning spaces. They suggest that libraries approach an assessment process using a broader perspective by asking key questions such as "what elements of the library renovation and newly configured services would support student success?" This article is a good companion to the Learning Space Toolkit (http://learningspacetoolkit.org/). Finally, the authors conclude that the connection between student learning and library spaces needs further exploration and research to provide a deeper understanding of the inherent value of library learning spaces.

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An Overview of the Digital Humanities

Donald J. Waters, Program Officer, Scholarly Communications and Information Technology, The Andrew W. Mellon Foundation

I n 2008, Ammon Shea published *Reading the OED: One Man, One Year, 21,730 Pages*. The book chronicled his effort to read the whole of the *Oxford English Dictionary* in one year. In his review in the *New York Times*, novelist Nicholson Baker characterized Shea's work as "oddly inspiring." Baker went on to observe that "Shea's book resurrects many lost, misshapen, beautifully unlucky words—words that spiraled out, like fast-decaying muons, after their tiny moment in the cloud chamber of English usage. There's hypergelast (a person who won't stop laughing), lant (to add urine to ale to give it more kick), obmutescence (willful speechlessness) and ploiter (to work to little purpose)—all good words to have on the tip of your tongue," Baker wrote, "when, for example, you're stopped for speeding."[1]

Here, I want to focus your attention on a phrase that is not "misshapen" or "beautifully unlucky," and its utterance will certainly not impress a traffic cop. However, it is a phrase that is enjoying a vigorous moment in the "cloud chamber of English usage," at least in the chamber that many scholars, librarians, and academic technologists now frequent. I refer to the much-used but ill-defined phrase, the "digital humanities."

Defining Features of the "Digital Humanities"

If the advantage of a standard is that there are so many from which to choose, then the same is true of the definition of the digital humanities. Each year since 2009, the sponsors of the annual Day in the Life of the Digital Humanities event have invited participants to respond to the question: "How do you define the digital humanities?" One senior scholar wrote simply, "I try not to." However, there are now hundreds of attempts at a serious answer on three different websites.[2]

Some of these scholars make the case that the digital humanities is an interdisciplinary field in which computer scientists and humanists find new questions to address at the intersection of their respective specialties. Unfortunately, I have found little evidence to support this definition. As a program officer at the Mellon Foundation, I have spoken with and provided funds for numerous humanistic scholars in various fields of study who have looked for common ground with computer scientist collaborators. They have all been quite clear that they were not seeking to create or participate in a new field of specialization. Rather, they were merely undertaking the normal process of negotiating the terms of a partnership.

In the compilations, there are also definitions that evade the enumeration of distinctive features but focus instead on the effects, or the desired effects, of the digital humanities. An example of this approach can also be found in a self-styled manifesto recently published by the MIT Press. The authors say that "Digital Humanities refers to new modes of scholarship and institutional units for collaborative, transdisciplinary, and computationally engaged research, teaching, and publications."[3] They provide a useful inventory of new modes of scholarship that include augmented scholarly editions, so-called distant reading, and virtual reconstructions.[4] However, in what ways are collaboration and transdisciplinarity distinctive to or

characteristic of the digital humanities? There is considerable irony that this collaborative work published in traditional print format by authors from several different disciplines is silent on this essential question.

Kathleen Fitzpatrick, an English professor who currently serves as the director of scholarly communication for the Modern Language Association, is one who has dared to offer a straightforward definition of the digital humanities. She defines the digital humanities as a specialist interdisciplinary area that can be characterized by (a) asking traditional and sometimes new humanistic questions using digital resources and methods; or (b) subjecting computing technologies to interpretation and critique by humanistic methods and strategies of questioning.[5] This definition usefully recognizes that multiple senses sometimes attach to the meaning of words. In this case, the first or primary sense emphasizes the use of digital methods in scholarly inquiry in the humanities; the second sense highlights critical questions about the increasing pervasiveness of digital networks and media in human discourse and social interaction.

Not all scholars are comfortable with the semantic complexity of multiple sense definitions. Let us concentrate for a moment on the second sense that Fitzpatrick identified in her definition. Inspection of the social and cultural dimensions of "the digital" milieu raises important questions including: the nature of contemporary social roles and identity; the meaning of privacy in a culture of government and corporate surveillance of personal behavior and communications; and the new forms of relationships between capital and labor, such as those that exist when wealthy Internet firms benefit from (or exploit) contributed information or unpaid work under the guise of activities such as so-called crowdsourcing. Scholars who are pursuing these increasingly important and serious questions clearly qualify as digital humanists under the second sense of Fitzpatrick's definition, but it is a matter of recent debate whether these activities are really sensible to include under the rubric of "digital humanities."[6] I wish to avoid the heat of these discussions by acknowledging that the meaning of the digital humanities in this sense is simply different from the primary sense identified in Fitzpatrick's definition and that care needs to be taken when using the term to ensure that subjecting "the digital" to critique from various perspectives in the humanities is not confused with study in the humanities that employs digital tools. Scholars may, of course, engage in both pursuits, but one activity does not imply or require the other.

When we subject the various definitions of digital humanities to scrutiny, it is thus hard to escape the conclusion that the primary sense of the term is as Fitzpatrick clearly defined it. That is, the central, defining feature of the digital humanities is the application of digital resources and methods to humanistic inquiry. I predict that the phrase "digital humanities" will not long endure in what Baker calls the "cloud chamber" of usage, but to understand the contemporary significance of the phrase, one can reasonably ask: What about the application of digital resources and methods deserves such special attention at this moment in time? Why, unlike other forms of humanistic inquiry driven by other kinds of methodologies, do the digital humanities require a special marker? Why is it necessary for our colleagues to invoke the digital humanities as if they were raising a flag to signal their allegiance to a particular cause? What exactly is the cause that they are flagging?

Corollary Features of the "Digital Humanities"

One can easily observe the overwhelming evidence that reliance on digital tools and methods is not only increasingly pervasive and powerful in the humanities but necessary simply to deal with the fire hose of scholarly evidence that has been converted to digital form or is natively digital. Yet, respected scholars like Anne Burdick and her colleagues in their recent MIT Press book repeatedly aver that "the **mere** use of digital tools for the purpose of humanistic research and communication does not qualify as Digital Humanities"[7] (my emphasis). What more needs to be added to what I have just argued is the primary, concise meaning of the "digital humanities"?

Perhaps the aversion of practitioners and observers of the digital humanities to such a concise definition is that we have only recently emerged from an era in which critical theory dominated the humanities and downplayed, as a lesser form of scholarship in the humanities, any emphasis on methodology in the handling of evidence. The retreat under critical theory from any serious treatment of these kinds of methods in the humanities has thus left many in the field with an impoverished vocabulary about the subject, and this weakness is manifest in many discussions of the digital humanities. Part of the definitional problem is that more needs to be said about the nature of the tools and methods for interrogating evidence in the digital humanities.

Fortunately, some scholars have begun systematic efforts to rehabilitate an understanding of the use of methods for evidentiary materials in the humanities. One of them is the distinguished medievalist, Stephen Nichols. In a recent article, Nichols draws on the work of philosopher John McDowell[8] and makes the distinction between "how possible?" and "why possible?" questions. "How possible?" questions are the province of engineering and the sciences. "Why possible?" questions, according to Nichols, are the foundation of the humanities because they "underlie most great literature, philosophy, history, and even theology…"[9]

What is the significance of this distinction for an understanding of methods in the digital humanities? Nichols criticizes Burdick and the co-authors of *Digital_Humanities* for conceptualizing methods primarily in terms of engineering and the sciences, which typically operate in the service of "how possible?" questions. Instead, research in the humanities requires tools and methods that are appropriate to "why possible?" questions.[10] Relying on the work of another philosopher, Richard Rorty,[11] Nichols emphasizes that the objects of study in the humanities are characterized by "contingency" and "irony" rather than truth or falsity, and require specialized methods. These methods are, in the words of Rorty, "experimental, nondogmatic, inventive, and imaginative." Disciplined, but not necessarily rule-based, they involve the application of "critical intelligence."[12] As Nichols summarizes the argument: "why possible?" questions "inform the dialectic between the inquiring mind and the object of investigation that critical intelligence engages when it thinks through and with contingent and ironic—that is to say, aesthetic—objects."[13]

If we accept the basic distinction that Nichols makes between methods in the service of "how possible?" questions and methods in the service of "why possible?" questions, then our understanding of the digital humanities is enriched if we are then able to begin to create a typology of the disciplined methods and

tools associated with the application of critical intelligence in various kinds of humanistic research. Just as critical theory became ascendant, at least three strands of serious and complex research were emerging, each of which required methods of applying "critical intelligence" specially suited to their objects of inquiry. These three strands correspond roughly to what many refer to as the linguistic, visual, and spatial turns in humanistic research, and each began intersecting with the capabilities of digital tools roughly at the same time in the late 1980s and early 1990s. They accelerated into the 21st century with the rapid growth of the Internet.

Like most people, digital humanists tell stories about their origins as a way of elucidating the essential features of their identities and roles. Digital humanists tell multiple origin stories. One refers to the Italian Jesuit scholar, Roberto Busa, who persuaded IBM in 1949 to help him produce the Index Thomisticus, a critically important, automated concordance of the works of Thomas Aquinas.[14] A second is the story of the birth of the legendary Institute for Advanced Technology in the Humanities at the University of Virginia in the early 1990s. The Adam and Eve in this story were Jerry McGann's Rossetti Archive[15] and Ed Ayers's Valley of the Shadows project.[16] McGann's project was an innovative, online form of criticism of the textual and visual works of Dante Gabriel Rossetti, the important 19th-century writer, poet, and artist. Ayers's project, which compared neighboring towns that allied themselves with different sides during the Civil War, was one of the first historical projects to combine textual analysis with online mapping to great effect. A third origin story gives credit to Bob Stein, the brilliant innovator and information designer, and the scholars who collaborated with him in using the compact disc medium in the late 1980s and early 1990s to produce a series of interactive, multimedia, scholarly companions to such works as Beethoven's Ninth Symphony and Shakespeare's *Macbeth*.[17] Copies of one or more of these works were included with virtually every personal computer sold at the time.

These origin stories anchor the digital humanities and their tool sets and related investigative processes in three broad areas: textual analysis, spatial analysis, and media studies, which has become focused more specifically on visual studies. As a rule of thumb, those who refer to the digital humanities, or to the use of digital tools and processes in humanistic study, are almost always pointing to activities and the types of tools needed in one of these three areas. At the risk of great simplification, let me sketch briefly the intellectual history that explains why this is so.

In language and literary studies there has been a long-standing interest in counting and collating words, parts of speech, and named entities. However, literary criticism stayed largely divorced from these activities until 1983 when Jerry McGann published *A Critique of Modern Textual Criticism*.[18] With ammunition assembled in part during the 1960s and 1970s by Continental and especially French philosophers, anthropologists, and literary critics, McGann dropped a bombshell on the field by challenging the prevailing assumption that scholars could explain textual variation principally by reference to the author's creative intentions. He argued persuasively that social, institutional, and collaborative factors in the process of textual production also need to be taken systematically into account. In the wake of the *Critique*, a variety of alternative paths for literary study opened. McGann himself led the way, and began to experiment with digitization and markup languages and other forms of computational analysis. The emergence of HTML and the web was a godsend and allowed him to

represent texts in ways that made it easier to identify, explore, and communicate his social theories of textual variation. Other scholars began vigorously exploring new, online ways of conceptualizing and representing scholarly texts. Under the general rubric of "humanities computing," a predecessor to the digital humanities, there emerged numerous sophisticated experiments in online textual analysis in a variety of literary fields, including the *Beowulf* and *Boethius* projects,[19] the Women Writers Project,[20] and editions of Piers Plowman,[21] Chaucer,[22] Dolley Madison,[23] and Walt Whitman,[24] to mention just a few.

Multiple facets of spatial analysis also converged with the emergence of the Internet. Computer-based geographical information systems, or GIS, emerged in the 1960s and captured the attention of a subset of geographers, whose studies benefited from the ability to quantify data and represent it in a spatial field. Other geographers dismissed GIS as mere technique and the dispute was so severe that it helped contribute to the dissipation of the field as many institutions eliminated departments of geography and placed their geographers in other departments. Meanwhile, GIS systems became easier to use and offered broader functionality that began to appeal to more than those scholars interested in quantification of spatial information. Archaeologists especially embraced the technology as an essential tool kit for representing and studying their evidence. Historians like Ed Ayers adopted mapping strategies that were not mere technique but helped uncover and represent essential social, political, and economic relationships. Harvard historian, Michael McCormick, undertook an even more ambitious project. He "re-mapped Europe from 300 to 900 CE, showing the connection between developments in communication and transportation that scholars previously studied in isolation."[25] With the even further simplification of spatial tools like Google Earth and virtual reality software for simulating real and imagined worlds, spatial analysis has become essential in urban studies and architecture and is being used not only to design new models of the built environment but also, as Bernie Frischer did in his Rome Reborn project,[26] to reconstruct and understand environments that may no longer exist or survive only partially.

Like textual and spatial analysis, media studies has undergone a substantial theoretical reworking. It now focuses primarily on visual media. Images in the form of photographs, film, television, and computer visualization have become so deeply woven into the fabric of modern reality that the contemporary human condition cannot be understood without "an account of the importance of image-making, the formal components of a given image, and the crucial completion of that work by its cultural reception."[27] To provide this account, visual studies now calls on and embraces a range of intellectual traditions including art history, anthropology, and psychology. Moreover, the scholarly tool kit must include a suite of specialized digital tools including various kinds of visual representations, both because the visual objects of study are digitized or born digital, and because words alone may not be sufficient to understand visual evidence and communicate an argument about that evidence.

As many broad rubrics do, the category of the digital humanities thus covers, and sometimes masks, a good deal of complexity. Once you see the divergent threads of tool-based intellectual pursuits of "why possible?" questions in the textual, spatial, and visual areas that have come together under the digital humanities rubric, you can understand the resistance of digital humanists to being dismissed as embracing pure method. The tools and processes they embrace and develop are mixed up in and not

easily separated from the related intellectual pursuits. The further lesson is that there is no single set of so-called digital tools, but multiple sets aligned along broad methodological lines, and the vision of integrating them in a single environment or infrastructure cannot be achieved simply. Such integration is a long-term not a short-term vision.

Future Prospects

I hope that by defining the digital humanities as the application of tools and processes to the "why possible?" questions of humanistic inquiry, and then by offering a typology of these tools and processes, I have been able to inject some clarity into this complicated topic. But what does this definitional framework suggest for the future trajectory of the digital humanities? Let me conclude by summarizing recent interventions by the Andrew W. Mellon Foundation and suggesting several areas that colleges and universities, and particularly their libraries, might consider for possible additional investment.

The Mellon Foundation has been vigorous in its interventions in textual studies and it has been trying to align its investments in tool making with the promise that they will advance in classical, medieval, and early modern studies compelling questions such as structure and reception of texts and the development of new genres of writing. I note in passing that Jerry McGann received a Mellon Distinguished Achievement Award that recognized in part the transformative effect he had on the practice of textual studies. Mellon's investments in spatial analysis have concentrated largely on archaeology and architectural history, especially the scholarly use of virtual reality tools. Ed Ayers is still pursuing his interest in spatial history, and the University of Richmond, where he is currently president, recently received a grant in Mellon's higher education program to help support this work. Several distinguished achievement awards also have recognized spatially oriented accomplishments. Harvard's Michael McCormick, whom I mentioned earlier, received one, as did Richard White at Stanford, who has been working on the historical geography of railroads in the US. The foundation has also recently launched an initiative on urbanism and architecture that falls broadly, but not exclusively, into this area of spatial analysis. In the domain of visual studies, Mellon has made substantial investments in ARTstor, and made a variety of grants to support performance studies, as well as the development of tools for visually based publications, such as Scalar, and for visual pattern matching.

Going forward—as centers of humanistic research and teaching—universities, their libraries, and academic presses must support the digital humanities, but where should they place their emphasis? I would suggest, first, that it is critically important that they be alert to the particular strands of research being pursued. The staffing, equipment, and related requirements for literary, visual, and spatial analysis are quite distinct. When single institutions cannot afford to cover all areas, there is plenty of room for division of labor. I would note that two grants that Mellon made at the end of last year focused on the institutional requirements for supporting the digital humanities and the potential for developing specialized, collaborative centers.

Second, the preservation of digital media is a critical area of research and development across the three broad areas of textual, spatial, and visual analysis.

Third, there is also an increasing need for certain kinds of tools or infrastructure that span the three areas. These include tools that support the basic scholarly process of annotation. Across all these areas the identification of named entities, such as people, organizations, and places is an important objective. The development of online databases of personal names (including prosopographies) and place names (such as gazetteers) will require continued support.

Fourth, investments in tools for textual analysis are now well advanced. While new understandings continue to be achieved, there is a growing imperative for the immediate future to concentrate more fully on tools that facilitate visual and spatial analysis, and to investigate audio and other areas that are emergent and do not fall in the three broad areas that have developed historically.

Fifth, a high priority remains to understand the requirements for publishing and curating scholarly products in these areas and building the necessary capacities in cultural and academic organizations for these functions.

Finally, the training of scholars and students to understand and engage imaginatively in tool-based modes of intellectual pursuits is a further imperative. Fellowships of various kinds are an important vehicle. But we must also think broadly about curricular interventions, for it is only when the tools and processes for answering "why possible?" questions are reliable enough to be introduced to and used productively by scores of students at once that the digital humanities could be said to have reached maturity.

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Library Space Assessment: Focusing on Learning

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Introduction

The months, or even years, of the building renovation project are over, students have overrun the bright, redesigned library space, and the renovation is acclaimed by all a success. It is common to hear many librarians note that their building renovation project is a success, and the evidence for that is almost always the same: the building is full of students who seem pleased with the space and accoutrements; the renovated library has become a great space to study, to socialize, and to work collaboratively.[1] In this era of accountability, is the fact that the library is now full of students enough to justify the generally hefty resources invested in the library renovation? Even if there is no pressure from the university administration to justify the expense of the renovation, are there opportunities to use the renovation to demonstrate the value of the library to the university's teaching and learning program and to showcase how the library contributes to campus life?

While academic libraries support the research mission of the university as well as its teaching and learning mission, many library renovations today focus on providing new types of learning spaces for students, especially undergraduates. Most faculty, as a result of the move to digital content accessible on the desktop from offices, lab, or home, do not regularly come to the library facility, and many graduate students seek traditional, quiet spaces in the library for their work. Library renovations generally focus on providing new types of collaborative, technology-rich spaces for students, developing learning or information commons in prominent areas, and some add campus services to support student success, such as the writing center, into that space.

We often call these spaces "learning spaces," but we do not have a good understanding of exactly whether and how renovated library spaces support broad institutional goals for student learning. Scott Bennett explored this issue in an article that attempts "to measure how campus spaces distinctively foster learning."[2] His work draws on specific learning behaviors identified in the National Survey of Student Engagement (NSSE) treated later in this article. Bennett's work is an example of the type of deeper analysis of the assessment of renovated library spaces—along with the associated services, technologies, and content provided there—that is needed by the profession.

Thinking about Library Space Assessment

The "Library Space Assessment: Bringing the Focus to Teaching and Learning"[3] workshop, held at the Library Assessment Conference in November 2012, was designed to help participants think more deeply about connecting completed space renovation assessment to student learning. Prior to attending the workshop, participants were asked to list some themes related to learning that were important issues in their institution. Some key topics identified included:

- Critical thinking

- Student success

- Undergraduate research

- Information literacy

- Writing and communication

Most academic librarians believe that their programs, facilities, and services support all of the above in some way, but demonstrating a direct connection between libraries and student success, for example, is not an easy proposition. Even more difficult would be demonstrating the value of the library **facility** to student success or any of the other topics listed above. While it may take a great deal of effort to frame questions and develop methodologies that address the role that renovated library facilities play in students' education, the results may assist the library in demonstrating to administrators and others the value of the library to the teaching and learning program of the university. Adding to the complexity, it is often the combination of the renovated space, along with the associated services and technologies that together create an environment that facilitates changes in learning.

In a study for the Association of College and Research Libraries, Megan Oakleaf looked at a wide range of ways in which libraries can provide value for the institutions they serve; her work addressed library spaces as one dimension that libraries can correlate with institutional data on learning.[4] The exercise of planning out an assessment program in conjunction with the library facility design process may prompt librarians to think more deeply about what they hope to accomplish for student learning as a result of the renovation.

When embarking on an assessment program for a renovated library space, these considerations can be used to frame initial discussions:

- Developing an assessment plan as a component of the overall design process

- Keeping the assessment plan tied to broader institutional goals, particularly related to learning, rather than more narrowly on library concerns

- Considering the key issues and methodologies in assessment in higher education and how they relate to the project

Current Library Space Assessment Practices

Librarians have developed sophisticated methods for understanding how students study and how they spend their time doing academic work. Inspired by the work at University of Rochester, pioneered by Nancy Fried Foster and Susan Gibbons, many libraries are employing qualitative methods and ethnographic strategies (observation, use of diaries, studying photographs, etc.) as a means to understand users' needs and plan a renovation of library space.[5] However, these assessment efforts most often focus on student behavior **prior** to the building project and generally do not examine whether the renovated space has, in fact, actually met student needs in a way that is better than the pre-renovation space.

At the heart of this needs-assessment research is a movement toward participatory design practices, whereby those stakeholders driving design decisions involve end users in the design process. The questions shaping such research focus on what users need in order to get work done and/or preferences for spaces, technologies, and collaboration. Although this kind of needs-assessment work is critical to creating library learning spaces that respond to user needs, demonstrating clearer links between student learning and a space after the renovation (i.e., post-occupancy) requires moving beyond preferences and figuring out, "Do they like it?" (i.e., user satisfaction). It means focusing on different research questions and making connections between departmental, college, and campus priorities for teaching and learning. National trends related to student learning assessment may also inform the assessment planning process.

Developing an Assessment Plan for a Library Renovation or Building Project

The role of assessment in the overall planning of a learning space is covered well in the Learning Space Toolkit.[6] As the library begins to think about how to shape an assessment plan, a first consideration should be which partners to bring into the process. Identifying assessment experts within the institution and soliciting their advice and input can be especially useful. These professionals may also be able to link the library's programs to ongoing assessments in other units of the university, such as the student success program, the undergraduate education office, the undergraduate research program, etc.

In developing a plan, there are many considerations a library may want to pursue, such as student study behavior in a needs-assessment phase, or user satisfaction and use of technologies in the post-occupancy phase. The information gathered from these efforts may be useful in shaping a facility that is popular with users. However, we suggest that libraries can do more to demonstrate what they contribute to the institution's teaching and learning program through some of the outcomes of library renovations if they approach assessment with a broader mindset. Some guiding questions to consider early in the development of an assessment plan include:

- What elements of the renovation will support important learning goals for the institution?

- What curricular initiatives in departments or colleges would benefit from the availability of new facilities, technologies, and services in the library?

- What elements of the library renovation and newly configured services would support student success?

- How does the library encourage student engagement with learning?

- What audiences does the library want to reach with the outcomes of the assessment program?

Thinking through these questions will help sharpen the focus of the project and encourage the planning group to consider shaping new services and adding new technologies along with planning the renovated or new library space. Such questions also require thinking carefully about campus priorities as reflected in its strategic plan and connecting with campus stakeholders—deans, faculty, learning technologists,

students, and others—to get a deeper understanding of current needs and future potential for teaching and learning at the institution.

After the renovation, post-occupancy assessment can focuses on questions such as:

- How does the facility (the combination of spaces, technologies, services, collections, and staff expertise) enable student learning?

- What is the impact of the library's facilities, technologies, and services that support specific academic programs? (For example, how did the library support the projects that students accomplished as the culmination of their undergraduate research program?)

- Do students believe they are able to accomplish a specific learning goal because of what the library provides? (For example, can students find resources, use equipment, and get support for complex multimedia projects better than they could prior to the existence of the facility?)

- For specific kinds of assignments, do faculty (or faculty and students) see improved quality due to the library's spaces and resources? (For example, are students better prepared to make oral presentations with supporting media when they have used the library's presentation practice spaces?)

- Is the availability of the library's spaces (and all they contain) helping to change how instructors teach and how students learn? (For example, does the existence of a SCALE-UP-style classroom—where students watch video lectures prior to class and engage in problem-based learning in the facility—improve information literacy skills?)

These are challenging questions that will require a range of quantitative and qualitative research strategies to develop an understanding of the library's impact. They move the library space assessment efforts beyond user satisfaction into making more explicit connections between the library learning spaces and student learning. As stated, partnerships with campus experts can be invaluable in shaping effective assessment projects and tying them to broader campus initiatives.

Aligning Assessment with National Trends and Campus Priorities

It is important for staff involved in library space assessment to be informed about both national trends related to assessment and how they impact their campus's priorities related to teaching and learning. Such awareness positions librarians to expand beyond library-centric thinking and consider the role of the library in student learning more broadly. It also allows us to be more proactive in designing assessment research questions and considering how assessment of the library space (and all it contains) can be merged into or respond to broader assessment efforts on campus.

An important driver in the increased attention to assessment of higher education teaching and learning is a call for accountability by state governments, governing boards, and the general public. As the costs of obtaining a post-secondary degree increase and a larger portion of the population pursues higher education, more individuals, governments, and other interested parties such as private funders, believe

they have a stake in the higher education system, and they want more transparency from universities and colleges. Two markers that are of particular concern to many citizens are persistence (continuing a program to completion and awarding of a degree) and time-to-degree (the number of years it takes students to complete a degree in a given institution). In order to get a better understanding of factors that interfere with persistence and that lengthen time-to-degree, many institutions are taking a data-driven approach to analyzing student performance.

Preparing for an accreditation review or an external review of a program or department may also be the impetus for increased attention to assessment on a campus. Campus administrators and those charged with managing such processes must decide what they want to measure, what methodologies they will employ, and how they anticipate using the results.

While there are many ways to approach teaching and learning assessment in higher education, three diverse themes have recently been in the news at the national level: learning analytics, faculty and student effort, and student engagement. Aligning library space assessment efforts with these highly publicized issues may be challenging, but connections are possible, and they may prompt closer attention to the library's overall service program.

Learning Analytics

Faculty make assumptions about student learning and continue to use traditional testing mechanisms to assess class performance. Many university faculty, whether by choice or necessity, focus more of their efforts on research than on teaching, and continue the practice of giving lectures and exams without careful analysis of where their students might encounter particular difficulties with the course content. Systems that employ learning analytics are receiving increasing attention as a means to understand what enables and what blocks student success in particular courses or curricula.[7] Software, installed as part of a learning management system or an institutional learning environment, log their activities as they complete assignments, use facilities, or attend tutoring sessions. Detailed data are collected on individual students' performance in courses; these data can include performance on quizzes, completion of homework, accesses of materials on the learning management system, and data from other units such as a writing or tutoring center. Advisors or faculty receive reports on students' learning activities and may receive alerts that some students are struggling in the course. Faculty can also analyze aggregated data to better understand where improvements are needed in the learning materials for the course and are encouraged to make revisions for future semesters. Learning analytics may be particularly effective in improving student success in large-enrollment, required courses thereby facilitating persistence in the program and institution.

Potentially, library data can be a component of learning analytics as well. Data such as use of the facility's collection, its equipment, and/or its group study rooms can be captured and could possibly be fed into the analytics software at an institution or correlated with relevant institutional student data such as GPA, major, etc. Privacy issues will be of concern to librarians in this arena, but there are methods available for securing user privacy. If libraries wish to participate in such efforts, it may require partnership with key campus stakeholders such as registration and records, institutional data, and faculty or staff with

expertise in data analysis outside the library. The University of Minnesota, Twin Cities, Libraries have published the results of two studies that examined the relationship between library use and student success and retention, employing the use of library data and additional data from the university's Institutional Research unit. While their work did not directly address the questions of contributions of library renovations to student success, their methodologies serve as an excellent model for future studies.[8]

Faculty and Student Effort

Researchers, state legislators, and the general public are examining the amount of effort (usually represented as time spent) faculty and students expend in teaching and learning. *Academically Adrift*,[9] which appeared in late 2010, provided data that demonstrated how little students were actually learning in their four-year undergraduate education (based on results from the Collegiate Learning Assessment, or CLA). The report also included data that divulged how little time students were spending studying outside of class. It is important to note, however, that the National Survey of Student Engagement (NSSE; see below), which also measures student effort, yielded higher numbers of student study hours than the *Academically Adrift* study.[10] Many students spend at least part of their time studying in the library, but these studies did not collect data on student location. Faculty effort expended in teaching has also been scrutinized, particularly by legislators, who may not clearly understand (or support) the fact that many faculty in research institutions have reduced teaching loads so that they may devote more time to their (funded) research. Since virtually all libraries report increased use after a renovation, it is interesting to consider whether these spaces promote more learning time for students outside of class. If a sample of students were studied before and after the renovation, it would be beneficial to many institutions to understand whether there is a measurable impact on the amount of time spent on academic work.

Student Engagement

The National Survey of Student Engagement (NSSE) is an instrument that uses broad topic areas to benchmark the degree to which students are engaged in learning: academic challenge, learning with peers, experiences with faculty, and campus environment.[11] The survey, revised for administration in 2013, continues to seek to identify educational practices that lead to student learning success in high performing institutions.[12] Clearly, many of the elements of student engagement have strong connections to the library; for example, NSSE questions address the types of assignments student complete, student experience evaluating information resources, and participation in a culminating senior experience (thesis, etc.). The NSSE has been called into question as a predictor of academic success,[13] but the survey was not intended to function in that capacity. Its purpose is to measure practices associated with teaching and learning in high performing institutions. It is currently in use in over 600 institutions. Many libraries work with NSSE coordinators in their institutions and some add questions addressing library services to the administration of the survey on their campus. There is also an information literacy module for NSSE in development.[14] The NSSE could help libraries study what impact the renovated space and new technologies and services had, for example, on involvement in undergraduate capstone projects or an undergraduate research program.

When constructing an assessment plan for a renovated or new library facility, the developers should

investigate what key national issues are of primary importance in their institution and should discuss whether it is possible to address those concerns through a particular approach to assessment. The University of Tennessee, Knoxville, Libraries are taking this approach in their work as part of the ARL LibValue project, and part of their effort focuses on the role of their Commons in student learning.[15] Partnering with campus units who may be involved in overall assessment work for teaching and learning may help libraries identify those key campus concerns and yield opportunities to share in the development of assessment instruments.

Conclusion

As libraries continue to focus resources on the design and operation of new learning spaces, the need for assessment data drawing lines between student learning and library facilities is gaining importance. A library assessment plan for a new learning space should be holistic, with user-needs assessment undertaken at the outset and post-occupancy research that moves beyond user satisfaction to examine more closely the impact on learning and teaching. It is not easy to make these connections between student learning and library spaces, but it is critical that we explore research questions that examine intersections. Unfortunately, there is a paucity of published and shared research in this area. It is important to explore these connections, however, as they can promote the value of the library to the teaching and learning program of the institution and, collectively, throughout higher education. Such research efforts would help libraries better understand and articulate the "learning" in our "learning spaces." More published and shared examples would benefit libraries as a whole.

Additionally, aligning space assessment with national and campus trends related to assessment—such as learning analytics, student effort, and student engagement—would increase awareness of the impact of library spaces. Although libraries are making forays into these assessment areas, more space-focused examples are needed for a deeper understanding of the inherent value of library learning spaces.

Resources for Learning-focused Assessment in Higher Education

National Institute for Learning Outcomes Assessment (NILOA)

http://www.learningoutcomeassessment.org/
This resource was developed to "discover and disseminate ways that academic programs and institutions can productively use assessment data internally to inform and strengthen undergraduate education, and externally to communicate with policy makers, families, and other stakeholders." Stan Ikenberry and George Kuh, two eminent higher education scholars, are co-principal investigators for this program.

Association of American Colleges and Universities (AAC&U), "Assessment"

http://www.aacu.org/resources/assessment/

A higher education association that is particularly focused on teaching and learning, the assessment resources included on AAC&U's site link to both their own projects such as VALUE: Valid Assessment of Learning in Undergraduate Education and many other institutional and national assessment materials.

EDUCAUSE, "Learning Analytics"

http://www.educause.edu/library/learning-analytics

This website aggregates EDUCAUSE articles, conference sessions, and briefings on learning analytics; EDUCAUSE has made this topic a major focus of their activities in recent years.

Learning Spaces Collaboratory

http://www.pkallsc.org/

Materials on this website include background papers and conference presentations related to all aspects of spaces created for learning in higher education institutions. Resources from this site can be especially helpful in assisting institutions in developing particular learning goals related to their physical spaces.

Association of College & Research Libraries (ACRL), "Assessment in Action: Academic Libraries and Student Success"

http://www.ala.org/acrl/AiA

Through this program, libraries are designing and implementing assessment projects focused on student success. Some projects will focus on tying physical spaces to student learning.

Endnotes

1   This article focuses on library space renovations since they are much more common than entirely new library buildings, but the same concepts apply to both new and renovated spaces. Some renovated spaces also include additions.

2   Scott Bennett, "Learning Behaviors and Learning Spaces," *portal: Libraries and the Academy* 11, no. 3 (July 2011): 765.

3   Joan K. Lippincott and Kim Duckett, "Library Space Assessment: Bringing the Focus to Teaching and Learning" (workshop presented at Library Assessment Conference, Charlottesville, Virginia, Nov. 1, 2012), http://libraryassessment.org/archive/2012_workshops.shtml#2.

4   Megan Oakleaf, *The Value of Academic Libraries: A Comprehensive Research Review and Report* (Chicago: Association of College and Research Libraries, 2010), http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/value/val_report.pdf.

5   Nancy Fried Foster and Susan Gibbons, eds., *Studying Students: The Undergraduate Research Project at the University of Rochester* (Chicago: Association of College and Research Libraries, 2007).

6   "Needs Assessment," in Learning Space Toolkit: A Resource for Planning and Sustaining Technology-Rich Informal Learning Spaces, http://learningspacetoolkit.org/needs-assessment/.

7   Malcolm Brown, "Learning Analytics: Moving from Concept to Practice," EDUCAUSE Learing Initiative (ELI) Brief, July 2012, http://net.educause.edu/ir/library/pdf/ELIB1203.pdf.

8   Shane Nackerud, Jan Fransen, Kate Peterson, and Kristen Mastel, "Analyzing Demographics: Assessing Library Use across the Institution," *portal: Libraries and the Academy* 13, no. 2 (April 2013): 131–145; and Krista M. Soria, Jan Fransen, and Shane Nackerud, "Library Use and Undergraduate Student Outcomes: New Evidence for Students' Retention and Academic Success," *portal* 13, no. 2 (April 2013): 147–164.

9   Richard Arum and Josipa Roksa, *Academically Adrift: Limited Learning on College Campuses* (Chicago: University of Chicago Press, 2010).

10 NSSE: National Survey of Student Engagement, "About NSSE," 2013, http://nsse.iub.edu/html/about.cfm.

11 NSSE: National Survey of Student Engagement, "Introducing an Updated NSSE," May 2013, http://nsse.iub.edu/Institutional_Report/Introducing NSSE 2013 One Sheet.pdf.

12 Alexander C. McCormick, Robert M. Gonyea, and Jillian Kinzie, "Refreshing Engagement: NSSE at 13," *Change: The Magazine of Higher Learning*, May–June 2013, http://www.changemag.org/Archives/Back Issues/2013/May-June 2013/refreshing-engagement-full.html.

13 Allie Grasgreen, "Major Engagement," *Inside Higher Education*, November 17, 2011, http://www.insidehighered.com/news/2011/11/17/nsse-2011-measures-student-engagement-major.

14 Terri Fishel, "Information Literacy Assessment and the National Survey of Student Engagement (NSSE)," *ACRL Value of Academic Libraries* blog, Auguest 14, 2012, http://www.acrl.ala.org/value/?p=412. See also: Kevin Fosnacht and Carrie Donovan, "Information Engagement: Preliminary Results From the NSSE Information Literacy Module" (poster presented at ACRL Conference, Indianapolis, Indiana, April 10–13, 2013), http://cpr.iub.edu/uploads/Information Engagement - ACRL 2013.pdf.

15 Regina Mays, Teresa B. Walker, and Rachel Fleming-May, "Aligning Assessment Efforts with Institutional Priorities: A Case Study from the University of Tennessee" (presented at the Fourth International Conference on Qualitative and Quantitative Methods in Libraries, Limerick, Ireland, May 22–25, 2012), http://libvalue.cci.utk.edu/sites/default/files/qqml-UT-2012_0.pdf.

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