Chapter 28: Student-Centered Libraries: Changing Both Expectations and Results

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Abstract

Sewing machines, ice-cream, slam nights and hot-glue guns. Today's libraries can be surprising places. The word "library" may bring to mind dark wood bookshelves, high ceilings, Gothic architecture and deep silence. In addition to such traditional reading rooms, today's academic libraries include presentation venues, video studios and spaces that welcome food, naps, social collaboration and mobile phone use. Librarians are no longer gatekeepers of knowledge; they play nuanced roles in guiding effective use of information for scholarship. In this chapter, we consider three theories from psychology: self-efficacy, stereotype threat and growth mindset, and the role of libraries as "the third place" set apart from work and home. We explore triggers for changes to library services: insights about how humans learn; the increasing diversity in the demographics of college students; the risks of information overload from search platforms moderated by corporations; increasing use of active and online pedagogies; and changes in perception of expertise, bias and validity. We consider campus tensions faced by academic libraries in terms of competition for budget, space and student attention. We share specific examples of spaces, collections and services that prioritize diversity, inclusion and belonging. We discuss how understanding the need for metacognition and self-management affects how libraries represent themselves to students.

Introduction

When the first-year students join Harvard University, they gather on the steps of the Harry Elkins Widener Memorial Library for a convocation address by the university's president. Modeled after the Parthenon in Athens, Greece, the building's large white marble pillars form an impressive backdrop for group photos. Four years later, the same cohort, costumed in academic robes this time, gather in the same spot for commencement exercises. The symbolic role of the library is powerful; it bookends the transformation of new arrivals into alums.

At many research universities, at least one library building has a privileged location, visible from a distance, at the center of the campus, weighing down a corner of a prominent grass-filled quadrangle literally and figuratively. The building features prominently in rites of passage and in the photographs of visitors with aspirations to enter the university. Tour guides describe the "miles of stacks" contained within, reinforcing the narrative that the library is *the place* for serious scholarship.

Library activities can be analyzed in three broad categories: spaces, collections and services. On a campus with multiple library buildings, distinctions are often made across buildings – go to this one for the humanities collections, that one for all-night undergraduate study, and that other one for the 3D printers, etc. Sometimes distinctions delineate different corners or floors of a single large building. The range of activities supported by libraries continues to grow, and this increases the complexity of helping students understand what is available to them and why.

As libraries evolve to serve the needs of specific academic communities, paradoxes emerge. Advances in cognitive science and psychology have raised awareness that "all learning takes place in settings that have particular sets of cultural and social norms and expectations and that these settings influence learning and transfer in powerful ways." (Bransford *et al.* 2000, p. 4) While the setting can be powerful, theories about meta-cognition emphasize that learners have paramount responsibility for managing and directing their own learning processes. *Thoughtful decision-making informed by student-centered learning theories helps academic libraries provide spaces, collections and services that better support undergraduate students in their journeys of self-transformation.*

This chapter explores how four theoretical frameworks – self-efficacy, stereotype threat, growth mindset and "the third place" – can guide library decision-making. One example is highlighted in each of the three categories of spaces, collections and services. Although the examples are from highly selective private research universities, the ideas are broadly applicable to academic libraries.

Theoretical Frameworks

We start with self-efficacy theory, first introduced in the 1970s. Albert Bandura defines perceived self-efficacy as one's own judgment of "how well one can execute courses of action required to deal with prospective situations." (Bandura 1982, p. 122). Bandura is recognized as one of the most prominent psychologists of the 20th century (Haggbloom *et al.* 2002), with several hundred studies documenting self-efficacy theory's relevance to higher education. The theory posits that one's expectation of one's own success affects willingness to embark on challenges, muddle through difficulties and persevere despite obstacles. Bandura describes four ways to increase self-efficacy: mastery experiences (repeated successes at overcoming adversity), vicarious experiences (seeing others succeed whom one perceives as similar), social persuasion (being advised that one will succeed), and the reduction of stress and negative moods (Bandura 1994).

Several factors affect students' self-efficacy when it comes to taking full advantage of academic libraries. Exposure to successful library experiences during high school builds confidence in students when approaching an academic library with its large, often intimidating, stacks and complex arrangement of books and periodicals. Students who have never asked a librarian for help in high school, or have had a negative prior experience, can be nervous about approaching "the reference desk" or making an individual appointment with an academic subject specialist. By creating a welcoming and relaxed atmosphere, connecting personally with students, helping them break down research tasks into smaller chunks, and providing scaffolding and coaching, librarians can increase the self-efficacy that students have for approaching new academic research projects.

On many campuses, the main library is seen as neutral ground, not affiliated with a specific discipline or department, and funded from a central source. As such, library spaces can increase self-efficacy by sheltering students from disciplinary cultures and providing encouragement to consider new academic fields, try on new areas of interest and explore leisure reading. Library collections can increase self-efficacy by revealing vicarious experiences (researcher role-models, successes of recent alums) and by broadening perspectives on identity and cultural heritage. Library services can help students gain mastery experiences in a supportive environment.

The stereotype threat theory explores performance barriers for negatively stereotyped groups. Claude Steele and Joshua Aronson first defined stereotype threat in 1995 (Steele & Aronson 1995) by revealing the importance of how questions are worded and what happens just before someone embarks on a standardized test. The theory reveals that when people are made aware of a stereotype that includes them, this awareness affects their academic performance by triggering anxiety and taking up cognitive bandwidth. For example, students who are made aware of their status as a "token" (from an under-represented minority, out of place, an outlier in demographic terms) face deficits for effective problem-solving (Saenz 1994).

In the context of library use, studies have explored the impact of stereotype threat on help-seeking and independent work behaviors. If students are engaged with a stereotype that they are less capable of conducting independent research, they may withdraw from asking for a librarian's assistance preferring to struggle in secret. One study finds that women who engaged with a stereotype that women are more dependent than men were less likely to ask for help, and when they did ask for help, they were less satisfied with the answers received (Wakefield *et al.* 2012). Another study provides an extensive literature review of library patrons' help-avoidance behaviors (Black 2016). Visible markers in library spaces - long hallways of portraits of founders who represent a more homogeneous demographic than the current student body, exhibitions that narrowly define library collections – need to be assessed in light of this theory. The language and visual representations in library signs and flyers, and the behavior of public service desk staffers are also worth examination.

The growth mindset theory described by Carol Dweck (2008) differentiates between a fixed mindset (the assumption that talents and abilities do not change over time) versus a growth mindset (the assumption that talents and abilities can be changed through practice, effort and study). Dweck argues that helping students see themselves as changeable can increase the efficacy of their educational experiences. Dweck gives examples of strategies that help students recognize their own growth, and ultimately come to see themselves as the architects of their own growth. Library-related publications on this theory are just beginning to emerge, such as Amanda Folk's analysis of its relevance for library instruction (Folk 2016). Library aspects related to the growth mindset involve revealing the process behind accomplishments, such as sharing early work from famous authors, and evidence of revision and iteration.

The theory of "the third place" discusses the ways in which place can affect behavior and outlook. In his 1989 book *The Great Good Place*, Ray Oldenburg coined the term "the third place" to capture the role of places that form the heart of a community that are distinct from home and work. His initial list focused on cafes and barbershops, but it was not long before libraries began to claim their contributions. Cathryn Harris discussed how "libraries with lattes" provide gathering places (Harris 2007) and Montgomery and Miller explore how good use of library spaces can create a sense of community (Montgomery & Miller 2011).

On college campuses, academic libraries are "the third place" because they are not the classroom or the dorm room. They provide a social space that supports academic work, but also includes a place to rest, mingle casually and connect with classmates. The perceived neutrality of libraries in contrast to departmental or dorm spaces is relevant. There are tensions however between the many places that can claim to be "the third place" on a campus. Libraries compete for student attention with gyms, chain-store cafes, student unions and bookstores. The differences between the impact of corporate and community spaces on student self-transformation need to be unpacked with a critical lens.

This chapter selects the four theories discussed above from a much larger set of theories relevant to library design because they provide insight into the process of student self-transformation. The

next few sections discuss library spaces, collections and services, with one detailed example for each category, reviewing trends with the framing provided by the four theories.

Spaces

Libraries are associated foremost with their physical spaces, as places "to go to", and the collections and services come to mind a little later. Although foot traffic may be declining, how the physical spaces look and feel continues to feature prominently in planning decisions.

Student Perspectives on Library Spaces

When considering library spaces, administrators benefit from explorations of how students learn. The seminal work of Nancy Fried Foster and Susan Gibbons at the University of Rochester used a variety of anthropological techniques to observe how students used library spaces as part of their overall study behaviors. They took on the research question: "What do students really do when they write their research papers?" (Black 2016) and using journals, observations, photographs and maps, they unearthed patterns of how students used libraries in conjunction with dorm rooms, classrooms, gyms and the rest of campus. Through the use of photographs, ethnography and story-telling, administrators continue to explore what students like and dislike about library spaces.

Focus groups with students from different socio-economic and cultural backgrounds help reveal the narratives students bring with them to campus. First-generation college students for example are not unique in reporting feeling less than comfortable in large quiet reading rooms with grand trappings and high ceilings. Large desks with a librarian situated far from, or at a higher level than, the person seeking assistance are often noted as obstacles to good communication.

Student reactions to traditional library spaces are complex. Qualitative data from first-generation students at Oklahoma State University reveals a love-hate relationship with library spaces with the authors concluding that "first-generation students perceived the library primarily as an important place that symbolizes learning and knowledge." (Neurohr & Bailey 2017, p. 171). Students expressed clear awareness of spatial features such as historic architecture and grandeur especially of the external facades.

Asking students to describe their favorite library space on campus is a simple technique for mapping out local spaces. It is likely that there will be many different points of view, and when amalgamated, they can fill out the picture of library use and preferences. Some students can clearly articulate the impact of historic grandeur on their self-efficacy, commenting that they feel smarter or more serious when they enter an imposing reading room. Others comment that they feel discouraged, or out-of-place. The stereotype threat theory can help unpack different reactions to the same space.

Observational studies support the recognition of the whole student – that students need to eat, sleep, rest and relax as well as study – and that libraries are often the location where many of these behaviors happen. Student advocacy has led libraries to loosen rules on eating and sleeping and broadened the understanding of appropriate behaviors. Consider for example the impact one student's advocacy had at the University of Maryland, bringing sleep pods to McKeldin Library (UMD Libraries 2018). What students see in the library, and what they don't see, may well influence their academic success.

Library Renovation Trends

Across the country, in response to reductions in print usage, libraries are spending millions of dollars to reduce on-site print and to renovate physical spaces (Watanabe 2017). Large numbers of books, microfiche, DVDs and other physical objects are moving out to large offsite storage places sometimes created by consortial arrangements. For example, the ReCAP consortium which includes four institutions from three states, manages a secure, climate-controlled facility in Princeton, New Jersey that safely stores more than 15 million physical items. With advances in shipping and inventory management, individual books can be delivered to the local library or to a faculty office within hours.

The process of reducing print collections on campus is not always smooth, as evidenced by a 2019 controversy at Yale University (Yaffe-Bellany & Stern 2019). Princeton University's Firestone Library recently completed a 10-year renovation project maintaining the unusual commitment that the same number of books remained on-site after the renovation as before.

Space for collaborative work was created by moving faculty offices and using compact shelving to compress stack space. The pressure to maintain browsability to support serendipity continues to be there, especially in the arts and humanities disciplines. Overall, however, national trends are consistent for libraries to repurpose space from stacks to hold books to active learning spaces.

With the removal or compacting of print collections, in addition to simple replacements, libraries also have the opportunity to reinvent their physical spaces. The winning entries in the 2018 Year in Architecture issue of *Library Journal* magazine ("The Year in Architecture 2018" 2018) feature library renovations with clear lines of sight, creative use of color and design, and support for creativity and contemplation. Renovations remove visual clutter, clear internal walls, reduce stack and carrel heights, and privilege natural light.

Libraries are also removing spaces that are clearly marked by specific cultures or time periods. Large ornate framed portraits of the university's founders or donors, who were often a less diverse group than the current student body, are coming down. In their place, it is more common to see steel and glass structures that are transparent, flexible and not clearly marked in terms of culture or time period. Abstract art replaces more traditional images. Environmental branding is used on blank walls and floors, using imagery that reinforces the library's strategic objectives. For example, Green Library at Stanford University has filled stairwells with enlarged, floor-to-ceiling "wallpaper" of maps from their special collections.

As universities increase support for active-learning pedagogies, traditional lecture classrooms are being converted into spaces that support small-group conversation, group display of results and easy transfer of the role of speaker. Lecture halls with fixed seats and a stage for the professor are being renovated steadily into large rooms with multiple projection screens, movable tables and chairs and rolling whiteboards. Library spaces are following these trends towards active learning, replacing fixed-seat computer labs with flexible furniture and creating small "hallway" spaces for experiential learning.

The process by which libraries renovate spaces can increase student engagement. Design thinking theories help explain that simply asking students what they would like is not productive.

One productive technique is the Design Charrette where the library hosts an open drawing exercise for students, faculty and other campus stakeholders to visualize different arrangements of furniture, technology and walls. ND Smith (Smith 2012) provides a detailed explanation, describes how the process helps stakeholders to share thoughts through the active drawing process, and creates a participatory design experience that has value for building broader support for library efforts. Sometimes students and faculty can be fixated on an obsolete interpretation of libraries (apologizing for not regularly walking through the stacks to find print books, for example, instead of recognizing that it is not the goal of the library to advocate for the print format), and a design charrette can help expand visions of what libraries can become.

Another technique for student engagement is photo-elicitation, from the field of visual anthropology (Harper 2002). Librarians ask students to take photos of their favorite library spot and share via an online platform such as Flickr or Instagram, followed by discussion of themes to inform planning. Or they share a curated list of photo links (libraries as well as locations such as community centers, malls and airports) and engage students in brainstorming what might work at the local level.

Small renovations can be powerful at building momentum for larger ventures. At the San Diego State University, a large public institution with a highly diverse student body, a series of small renovations have helped engage students with library planning and raised awareness of the need for library spaces to reflect university branding as well as local history. Decisions on paint colors and furniture have had notable impact in creating welcoming spaces (Estchmaier 2019).

Sanctuary

Libraries are often associated with notions of sanctuary. Traditional library reading rooms are strongly reminiscent of religious structures, with high ceilings, tall windows, rows of tables, Gothic trimmings and large quiet spaces. Libraries are known for including materials out of the mainstream – controversial viewpoints, minority authors, "banned books" and narratives that contradict or critique the status quo – and they protect the privacy of patron reading records. Notions of sanctuary are broadly relevant to discussions of inclusion and belonging. If a student feels out of place in a library then it is no longer serving the function of sanctuary. Portraits,

decorations, the language of signage, and facilities such as gender-neutral bathrooms can all affect the sense of sanctuary.

Libraries can use objects of art to enhance the sense of sanctuary and to set apart library space as different from other campus spaces. In her 2017 dissertation (Carello 2017), Anna Carello examines how elementary school libraries use "whimsical objects" such as murals, papier-mâché sculptures of animals and giant puppets to mark off the library as a space to be away from everyday experiences. Such whimsical objects can echo the library's history such as Princeton University's Firestone Library wall art created from the faces of wooden card catalog drawers (Mazarakis, 2019).

Sanctuary brings to mind quiet, reflection, peacefulness – which may seem contradictory to libraries that privilege collaborative spaces, loud cafes and active foot traffic. The trend towards permeability, discussed next, is in active tension with the need for sanctuary.

Permeability

The concept of permeability is increasingly common in the design of library spaces. In Figure 1 (Gayley 2017), Cliff Gayley from William Rawn Associates provides four diagrams of how foot traffic moves in and out of a library. A traditional library building had a single entrance, often an imposing one with a guard to prevent book theft. One would not enter the library unless one needed a book from within. Newer library designs are explicitly permeable. Some libraries have two entrances so people can flow through the library whether or not they need to access a library resource. Some libraries are located inside a student center or multi-purpose building. Others include academic support partners inside the physical library. Students who need help with writing or technology troubleshooting come in to the library for services provided by other entities. A highly permeable library functions like a crossroads with significant foot traffic, event programming, and overlapping activities.

There is a clear tension between sanctuary and permeability. A library with many entrances and active foot traffic cannot easily provide a place to reflect and step away from daily pressures. An ideal library would include a variety of spaces so that students could easily control their

environment. Students will come to the library several times each semester and will often spend long periods of time there at a stretch. Different students will prefer different types of spaces (noisy vs. quiet, messy vs. clean, flexible vs. fixed), and the same student will need different spaces over the course of the day. A student might start work in the quiet reading room in order to focus, and then look for a short break at a café before joining a workshop. As discussed in the following example, flexibility of space can significantly impact the student experience.

A Flexible Presentation Space
The Godfrey Lowell Cabot Science Library at Harvard University opened in 2017 after a significant renovation. The Science Center building that houses the library was designed by Josep Lluís Sert in 1976 and is a large brutalist building with a high-traffic indoor crossroads. Several thousand students, faculty and staff traverse the building each day. Almost every first-year student has a class in the building during academic semesters. Prior to renovation, the library was cloistered away behind a thick wall. Many students were unaware that the library existed, its entrance hidden behind an alcove.

The renovation included the library, café and courtyard, tearing down several dozen internal walls and replacing others with glass. The library entrance is now shared with the café. People working inside the library can be seen from an outdoor plaza and from the first-year student cafeteria. The entrance includes the "Discovery Bar" – a whimsical object that is a serpentine table with a translucent surface – and a large double-sided projection screen. When students present their research at the Discovery Bar, their slides are seen by the hundreds of people walking through the main ramp. The result is a "smart learning environment" that supports rapid prototyping, interactive displays and easy ways to showcase student research (Huang & Vedantham 2019).

The renovation brought in several whimsical objects – a "fish table" with movable fins, chairs that spin like tops, and resemble cows and rabbits, tables made of jigsaw puzzle pieces – and almost all the furniture can be moved by students without assistance. The space is friendly to food, sleep and noise, and is open all night. It transforms quickly, into a dance floor for a first-year orientation event, a stand-up area for casual conversations or a formal presentation space for

an academic conference. By hosting events that are student-run and student-presented, the library meets student expectations in creative ways.

The library collaborates with the undergraduate science research office to convene a poster fair where undergraduates present research results to an audience of their professors, peers and campus academic support providers. When students present their research at the Discovery Bar, the presentation space feels informal. The bar to entry is lowered. They give five-minute "lightning" talks with their friends in the audience, and also connect with passersby outside the library. After their talk, they stand next to their posters to answer questions. They begin to see themselves as scholars, as part of the academic conversation, and visualize how they can improve their scholarship over time. Moving from audience to presenter and then back to audience is quick and feels quite different from presenting in a traditional lecture hall. Concepts of perceived expertise and self-directed learning are explicitly revealed. After the research poster fairs, students reported that they gained confidence through creating a visual representation of their research and speaking about it at the Discovery Bar. Faculty shared their pride in the students' growth as researchers. The cross-disciplinary nature of the library space received positive comments from both students and faculty.

The four theoretical frameworks – self-efficacy, stereotype threat, growth mindset and "the third place" – apply to this example. By providing a space that is prominent and visible and yet casual and supportive, the library has provided students with an opportunity for gaining self-efficacy. The flexibility and generic nature of the space help with stereotype threat, and the structure of the activity promotes a growth mindset. The library as "the third place" helps diffuse disciplinary pressures. The audience is from all over campus, and students need to explicitly pitch their presentations accordingly.

One of the tensions faced in the Cabot renovation is the relatively low profile of library collections. The next section discusses how creative management of library collections can assist with student self-transformation.

Collections

Library collections help students learn about, engage with, and reinterpret the past. The same collection serves different purposes in different times. In recent years, universities are addressing their own histories with slavery. Students are digging through institutional archives with new interest in bills of sale, receipts and wills. These documents were collected long ago, intended to record the accomplishments of prominent donors and leaders. Today, these documents are raw material for a very different purpose. Helping students connect directly with library collections to answer *their own questions* can bring powerful rewards.

Joan Lippincott advocates for the importance of libraries making their content visible and avoiding the trap of being perceived as just study space or as holding spaces for books. In her 2018 article, she describes the need to showcase content – recently created content such as undergraduate research posters and traditional content such as special collections treasures – as part of the refurbished spaces that libraries provide (Lippincott 2018). As print collections move to offsite storage, libraries are exploring ways to highlight collections in more nimble ways.

Digital signage and flexible exhibit cases support programs to help students display their own work as well as curate works from the library's collections. Institutional digital repositories can help archive work from student projects, situating student work clearly in the journey from high school to graduate school. Library administrators need to consider what is selected for exhibitions, who is represented, how they are represented, and whether the context helps students see themselves as changeable.

Revealing the processes behind library collections has benefits. Students can reinterpret items from previous centuries with the new lenses that come from advances in sociology and psychology research. They can understand "how the sausage is made" in terms of how valuable items from one country end up in a library in another country. They can grapple with issues of provenance, property rights, licensing and copyright that complicate library projects.

A simple way to connect students to collections involves opening up the library itself as a topic of study. Students can explore the "life" of an item in special collections – where it was created and how it found its way to the library. They can interview the library staff who participated in

the process and can tour the physical spaces where items are received, catalogued and displayed. They can capture oral histories of local donors. Such a program can also address pipeline issues in librarianship by increasing the awareness about library careers, a valuable outcome since ethnic and racial diversity in librarianship is an area of national concern (Morales *et al.* 2014).

Investigating local history as a way to ground special collections can be fruitful. The former name of Rowan University, located in southern New Jersey, was Glassboro State College, referencing the nearby glass-making industry. The Campbell Library builds on this history with displays of glass objects made by local artisans ("University Archives & Special Collections" 2017). Collections related to local history are often of great value to the surrounding community and can connect students with historical societies. Connecting collections of local history to international consortial networks such as HathiTrust and the Digital Public Library of America increases discoverability for student research projects and also benefits the community.

Libraries have involved students in activities such as binding and conserving books, stitching books, making paper by hand, exploring letterpress technology and learning advanced digitization techniques. Often librarians express surprise at how much students enjoy "old-fashioned" library tasks. Collections-related activities can be used pro-actively to connect with students in new ways, opening up access, building confidence, and lowering barriers to entry. Such activities can also help students slow down and reflect, a precursor to meta-cognition.

A Student-Curated Publication
Libraries are recognizing the importance of connecting their special collections to prominent exhibitions (virtual and physical) and website content (Lippincott 2012, p. 65). Involving students in the curation of content can be powerful. Established in 1942, the Houghton Library at Harvard University has been described as "an enchanted palace" holding many rare items including the desk and chair used by poet Emily Dickinson (Carling & Rosenberg 2017). Recognizing that the value and rarity of items owned by the library can be intimidating, librarians and administrators have carefully constructed programs for outreach. Through the Houghton Library Undergraduate Fellowship Program, launched in 2016, a small number of students receive paid summer fellowships to conduct independent research. The students engage

deeply with research apprenticeship, with hands-on learning and exploration of primary sources. The students propose their own research or creative project, and after working on it for the summer, they present their work to a campus-wide audience. Students build expertise in a specific aspect of the library's collections and create projects such as letterpress books, exhibitions, digital humanities projects, podcasts, opera, zines and even a tarot deck. In the process, they also gain understanding about careers in librarianship.

One undergraduate student[i] was concerned that classmates did not understand the resources that were available through Houghton and set off on a quest to connect Houghton's collections with the disciplinary foundations of each of the 49 majors (locally called concentrations) available at the university. As one may imagine it is a little easier to connect Emily Dickinson's original poem manuscript to the English Literature field than to find an iconic item for electrical engineering. Nevertheless, the student persevered. He used social media channels to share his reflections when finding objects of interest in the collections. He connected with librarians in several departments as well as with academic administrators. His work, now called *Compass*, celebrates Houghton Library's collections in a way that is directly accessible to current undergraduates, with a print publication and a website that has received campus-wide attention.[ii]

The fact that *Compass* was created by a student affects how the project is perceived by campus stakeholders; it is qualitatively different from a library publication. Adding the student voice to the interpretation and presentation of library collections helps demystify them and emphasizes the role of individuals in constructing meaning for the objects that are stored by academic libraries. Students often react differently to a student-created exhibition than they do to a library-created one; the professional distance between the creator and the participant is narrowed. The participating students gain mastery over "grown-up" tasks such as curating objects, composing commentary, and representing the project to a general audience. They gain self-efficacy on several career-relevant fronts. By representing library collections as raw material collected by individuals and available for new interpretation, such programs address stereotype threat and growth mindset.

Repercussions of Online Reading

Compass revealed the wealth of collections held in a single library building. It's much more common now for students to access materials online that are owned by multiple libraries and corporations. They access journal articles and books online through the gateway of the library catalog, through corporate gateways such as Google Scholar, JStor and Ebsco, through non-profit gateways such as Wikipedia, and user-financed gateways such as SciHub. The boundaries between library-owned books, library-licensed journal databases and materials on the public web become blurry. Students read journal articles on their phones, copy and paste text without careful attention to copyright and academic integrity, use hyperlinks to jump from one source to another, and search for phrases in online articles instead of reading full narratives. They face significant challenges in assessing the quality of what they read.

As documented by a 2014 survey of undergraduates at the University of California, Los Angeles (UCLA), undergraduate students express preferences to read required material in print format but then end up reading materials online because it is faster or more convenient (Mizrachi 2014). They recognize that the absorption of concepts is easier in print, but continue to take shortcuts to save time.

Libraries can help address student reactions to information overload. Students who are not comfortable yet with advanced database searching may be wading through thousands of hits from Google searches, steadily losing confidence without understanding the biases and structure of the algorithms that are sorting results for them. Librarians can help students recognize their own vulnerability to information overload, emphasizing the importance of iterative searching, and understanding the biases and perspectives of what is found. Librarians can also point out that scholarship is constructed by specific groups of people, and that unpacking the process by which journal articles and books are created can help students make better decisions in their own research. As students reflect not only on the sources they have found, but how they have found them, and how they will use them in their own writing, they develop intuition regarding discipline-specific research methods. Students can also gain understanding into the long-term consequences of cutting corners in their reading practices.

Services

Student-centered learning theories can help guide decisions on library services in ways similar to those just discussed on spaces and collections. Library services vary substantially across institutions. Common examples of reference services include staffed assistance desks, online chat, research appointments, group instruction and demonstrations. For special collections, libraries may offer a facilitated reading room, high-quality scanning and digitization, or assistance with publication, website or presentation materials. Some libraries offer high-tech services such as 3D and poster printing, website development, text mining, and support for "digital humanities" projects.

Libraries are often among the largest employers of student workers on campus. Providing opportunities for student workers to learn skills on the job, with explicit acknowledgment that a library job is a learning experience for the student, can help students imagine themselves in a variety of careers – from public service to teaching to collections development to computer science. Effective use of student advisory boards and connections with student government can also help libraries build strong communication channels so that input can be gathered organically when a service design decision needs to be made.

Some library services are structured as "we will do this for you" (such as interlibrary loan, digitization or conservation) while others are structured as "we will teach you how to do this yourself" (such as digital humanities centers, research data management and citation management workshops). In the first category, revealing the process that led to the result can help improve self-efficacy for the patron, with the idea that "this is not rocket science." In the second category, employing students to help with the teaching broadens participation. Emphasizing that "you can learn to do this yourself" has important consequences for a growth mindset.

A few examples of unusual services in libraries help demonstrate how paying attention to student behaviors and requests can lead to thoughtful adaptations. Laptops and mobile phone chargers are now popular additions to library lending, reflecting acceptance of student technology needs. The Wolbach Library at Harvard Smithsonian Astrophysics Center began lending bicycle repair kits through their technology lending program ("Wolbach Library Devices" 2017) after noticing

that students would discover mechanical problems after riding their bicycles to the library. The Lillian Goldman Law Library at Yale University (Yale Law Library 2016) lends a variety of unusual items including snow shovels. The Countway Library of Medicine at Harvard University provides a short story dispenser ("Short Story Dispenser" 2019) for a quick poetry or fiction boost as well as therapy dogs for cuddling ("Therapy Dogs" 2019). By explicitly providing items that encourage reflection, relaxation, creative thinking and social interaction across disciplinary boundaries, libraries can incentivize meta-cognition.

Shared Services

The library is often the host or the location for academic support services, in spaces often delineated by names such as "information commons", "knowledge commons", "research commons" etc. (Lippincott 2012). The process of hosting academic support by campus partners can be complex. Some libraries hand over library space fully for office and consultation spaces for the campus writing center, public speaking center, tutoring, counseling etc. Some libraries host the services of partners in library spaces – sometimes in a dedicated space, and sometimes as a shared service point. Some libraries are co-located with a center located next door or sharing a common entrance. The process of sharing services and space across organizations can be complex, but also powerfully student-centered.

Libraries can be wary of setting precedent. If a library begins hosting the writing center on the main floor one evening a week, will that lead to the writing center asking for office space next? There is a tension between defending the space footprint and keeping the program student-centered. Organizational funding models further complicate the picture. Many branch libraries rent their space from their departments, and when those departments face space crunches, the library space can often be seen as "fallow land" available for repurposing. How libraries connect services to space influences perceptions of added value. Is it clear why a particular service is located where it is? How do people walking through a library become aware of the services available? Do people know how to request improvements to a service, or how to connect with library decision-making? How is the library café different from the local Starbucks?

Generally, students treat all staff interchangeably. Anyone behind a large desk at the library is assumed to have general expertise on all topics. The ability of librarians, tutors and academic advisors to refer seamlessly to each other can be especially helpful for students who are facing difficulties or are hesitant to ask for assistance. Library space that is carefully tied to collections and services is less likely to be seen as "just study space" and therefore less vulnerable for absorption into non-library purposes.

Makerspaces and Specialized Spaces

Libraries are increasingly interested in supporting makerspaces and multimedia creation. The Hunt Library at North Carolina State University is well known for its innovative spaces that include a game design lab, a 3D scanning studio, a 4K video studio and a robot alley ("Explore Spaces" 2019). The large building which opened in 2013 includes several spaces that explicitly favor new technologies over print collections (Madsen 2013). While some libraries set aside internal space for "making" activities, others partner with formal makerspace studios around campus so that the students use existing facilities to make objects that are showcased at library events. Such partnerships bring attention and foot traffic to a studio that is within an academic department while enabling the library to showcase and display items that require infrastructure outside the library's scope. For example, a consumer-grade 3D printer can be hosted in the library, with signage and sample objects representing more advanced projects possible in specialized research laboratories elsewhere on campus. The library is the matchmaker connecting interested students with facilities, and the convener for user groups, building on the perceived neutrality of library spaces.

In their book *Reconceptualizing Libraries: Perspectives from the Information and Learning Sciences* Victor Lee and Abigail Phillips provide a thorough overview of cases and models where libraries are taking on new services including providing makerspaces (Lee & Phillips 2018). In the chapter "Makerspaces in Libraries" the authors explain, "Among the social roles libraries play, library makerspaces promote *knowledge creation*, *access*, *learning* and *equity* and *diversity* with and through their *community*" (Koh *et al.* 2018).

The design of library services can support student self-transformation. The example below shares ideas for implementing a makerspace with deliberate attention to gender differences, inclusivity and self-management.

A Feminist Makerspace

Penn Libraries at the University of Pennsylvania provides a range of high-tech services including an extensive 3D printing program, technology lending, a video studio, a multimedia design lab and poster printing ("Search Equipment" 2019). Many technology services are staffed by graduate students, sending a clear message that these are learnable skills. The Education Commons is a unique library space. Prior to 2012, it was an unused corner of an athletics building underneath the stadium seating and above an exercise room. A creative renovation produced a "library with no books" – a space designated for collaborative study in a location close to athletic and engineering facilities. Interest in using the space for makerspace activities grew partly as a result of the library's location and physical constraints in terms of ambient noise and narrow hallways.

The university has several makerspaces, some in the engineering buildings and some in other libraries. The addition of a makerspace in the Education Commons required articulation of why another one was needed, and how this one would be different. The makerspace began with a few consumer-grade Makerbot 3D printers, designed in coordination with other makerspaces around campus. The two librarians who manage programs in the Education Commons noted that other makerspaces were restricted to students in certain schools or courses, and that users of the library's 3D printing services were overwhelmingly male (Moody & Spivak-Birndorf 2019). They also noticed that students would keep edging closer to the 3D printers, curious about how the filament was loaded, and itching to try it themselves rather than waiting for the "expert" library staff to take care of the printing. When the staff were not at the desk, students would walk behind into the staff-only area to get a closer look when an object was being printed.

The two librarians used feminist pedagogy to holistically design workshops with the express goal of bringing a more diverse group of people into workshops to work directly with the 3D printing services. They built on research noting that women appreciate the sense of community provided

by makerspaces (Bean *et al.* 2015). They designed the print flyers for tech workshops to include faces and hands representing diversity in ethnicity and gender. They provided training on how to load filament and arranged for students to self-print after completing training. They shared student work through Instagram so that students could see what peers were creating. They began outreach to the graduate school of education which includes teacher training programs.

They created a workshop titled "3D Jewelry Design and Printing" where participants learned how to design and print their own jewelry. Several women attended this workshop and successfully queued their creations on the printer by the end of the workshop. Some later returned to complete the self-service 3D printer training. This led to word-of-mouth outreach for similar workshops later in the semester. They incorporated 3D printing services in a theater design class, helping students designed sets using Sketchup software. Students printed their 3D set items, set up a mock stage and moved their set elements around for a class exercise.

They documented their thought process through several blog posts. In one, they describe using challenges, puzzles such as a maze constructed on the library floor, virtual reality headsets, and multimedia such as a "women in science fiction movie series" to broaden interest in the Education Commons (Moody 2018). In another, they share lessons learned from incorporating 3D printing into a French course[iii] to create objects that represent abstract concepts such as guilt (Spivak-Birndorf & Karasic 2019). A third discusses celebration of women mathematicians who contributed to ENIAC, the world's first general-purpose electronic computer (Spivak-Birndorf & Moody 2019).

Notably, the innovations described above are not technical or facility-based; they involve thoughtful design keeping student-centered learning theories in mind. Such efforts can change perceptions of "fit" for students, increasing self-efficacy and reducing the effect of stereotype threat. Taking ownership over the production of objects helps instill a growth mindset in students. The location of a makerspace in the library is helpful in terms of the concept of "the third place." Imagine the difference between struggling with 3D filament in an engineering lab while classmates are watching compared to doing the same in a neutral library space where the other people around are not likely to be working on the same class assignment. Learning "how to

make" in a nurturing environment can help students become proficient and confident so that they can take on similar tasks in makerspaces that are less inclusive.

Conclusion

This chapter has described how the leaders of academic libraries can manage spaces, collections and services to support student self-transformation, keeping in mind four specific theories: self-efficacy, stereotype threat, growth mindset and "the third place." Libraries are steadily responding to changes in how print is used, awareness of how students learn and pressures relating to space and budget. Many libraries are taking on renovations of spaces keeping in mind the changing expectations of students and faculty. Popular innovations include active learning classrooms, spaces that are flexible, welcoming and inclusive, and furniture that is easy to move.

Changes in spaces can be more visible than changes in collections and services. On the collections side, libraries are recognizing patterns of use of print collections and making strategic decisions regarding offsite storage, better online discovery systems and the use of frequently changing exhibitions to showcase the highlights. They are integrating student perspectives into how past collections are examined and how future collections are built.

Creative service development builds on understanding of diversity and inclusion – what makes students feel comfortable, welcome, capable and engaged. Libraries can amplify student voices through student-presented workshops, student-authored blog posts and student-curated exhibitions and publications. Paying attention to student behavior and facing uncomfortable truths can help libraries stay relevant in light of the explosion of online content.

Ultimately, building on the importance of meta-cognition, helping students see themselves as part of the library and being able to contribute to its future will have many positive consequences for the library as well as for the students' career development. Libraries compete with campus partners and corporate entities for budget, space and human resources, and for the attention of students and faculty. Student-centered learning theories can help library leaders to design spaces, collections and services that clearly articulate an answer to the question: "So, what makes *this place* a library?"

Acknowledgements

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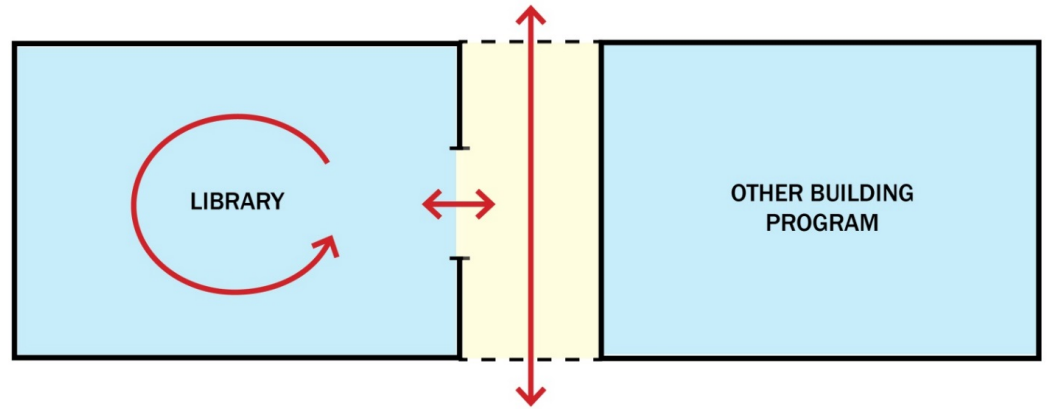
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[iii] Course taught by Mélanie Péron, faculty member in French at the University of Pennsylvania.
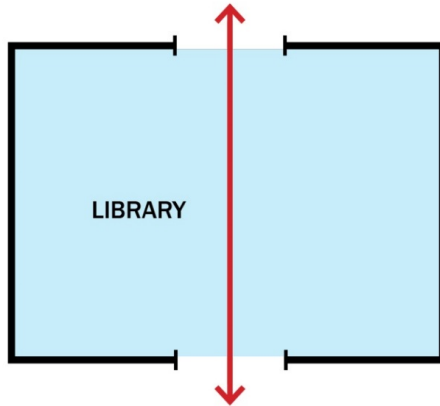
SINGLE ENTRY
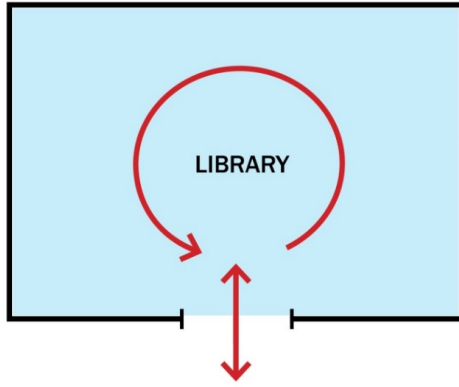
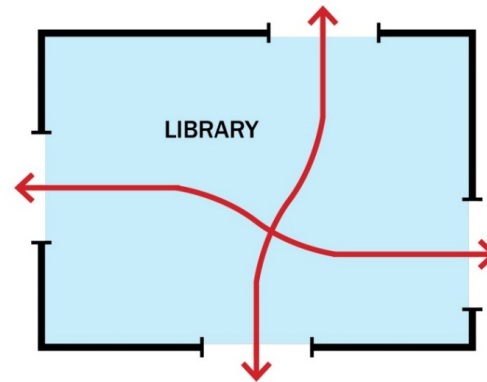**ACCESS OFF INTERIOR STREET**

PASSAGE THROUGH LIBRARY

HIGHLY PERMEABLE

Figure 1.