

Public Report on Inclusive Library Study Space Design

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Table of Contents

Table of Contents 1

Executive Summary 2

Furniture 3

Noise 7

Aesthetics..... 10

Food/Drink 11

Signage..... 12

Websites about Spaces 13

References 13

Executive Summary

A review of literature across a variety of areas related to inclusive library study space design yielded the following concerns and suggestions.

- Furniture
 - Large, open study spaces present privacy and noise problems. Even for noisy zones, these spaces should be broken up with dividers and height-varying furniture. Quiet zones should avoid high-density seating and seating that forms groups.
 - Patrons with mobility issues may need additional space around furniture or access to lower tables for service desks and public terminals. An in-depth user study of patrons with disabilities should be charged.
 - Large social groups can create a hostile environment that is unwelcoming to others. While furniture arrangement can discourage some group activities, a truly inclusive space should have and enforce policies that protect vulnerable populations.
- Noise
 - Noisy zones in libraries should take advantage of other sources of noise, like service desks, cafés, and copy machines. Quiet zones in libraries should be separated from sources of noise, perhaps on separate floors.
 - Consider duplicating important services like public computing in both noisy and quiet zones.
 - Noise norms should be (carefully, politely) enforced to protect the library's ability to offer quiet and safe study environments.
 - Reservable individual study rooms have the potential to support a variety of patrons and might help eliminate a source of noise pollution on quiet floors.
- Aesthetics
 - "Neutral" design is not truly neutral, and there is no one size fits all when it comes to aesthetics. Library spaces should employ a variety of aesthetic choices to be inclusive to our large population of patrons.
- Food/Drink
 - Food-free spaces are essential for some patrons, while having access to food is essential to others.
 - Offering microwave and refrigerator access is an inclusivity issue for low-income and non-traditional students.
- Signage
 - Signage should be clear, simple, visual, and prevalent.
- Websites about Spaces
 - Library websites should include detailed information about physical spaces. This is particularly helpful for patrons with disabilities.

Furniture

When designing library spaces, choices around furniture can be both highly powerful and highly problematic. Small changes in furniture design and placement can have a large impact on the perceived usefulness and inclusiveness of the space.

One of the more frustrating aspects of furniture choice for library space designers can be the lack of agreement amongst students. For every student who prefers one style of chair, there is another who prefers the opposite. It is an area where the only consistency seems to be the lack of consistency. Likewise, when trying to meet needs for explicit requests, very small details about the actual furniture chosen can cause that item to be considered a failure. The result might be characterized as, “Sure, I wanted a standing desk... but not **that** standing desk.”

In the literature as well as our findings at Duke University Libraries (DUL), the most requested features of study spaces include a large amount of table space to work, adequate task lighting (preferably natural lighting), and access to working electrical outlets (Andrews, Wright, & Raskin, 2016; Hegde, Boucher, & Lavelle, 2018; Mohanty, 2002). Additionally, the literature and student feedback both support the need for a wide variety of types of furniture and space designs (Couture et al., 2021). Variety helps accommodate different personalities, different types of work that needs to be done, and different accommodations needed by different people.

This vision of variety in libraries to support modern study habits is well captured by the following quote:

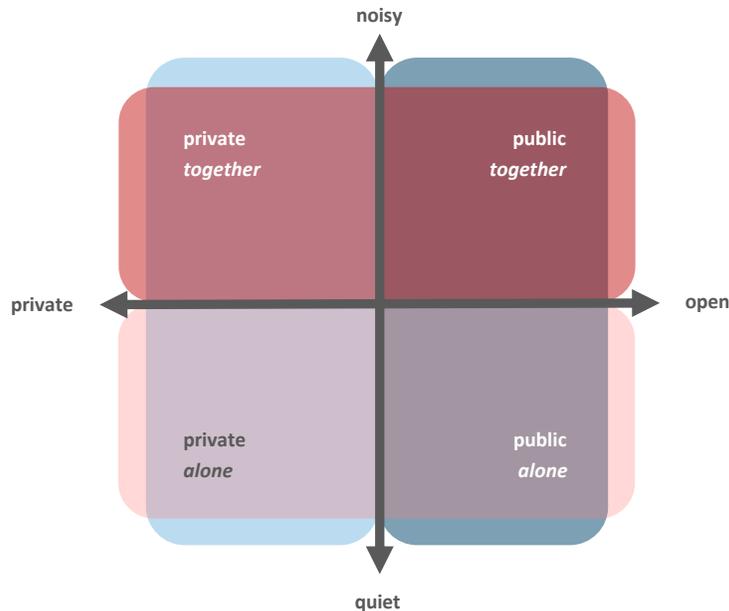
“...the team sees libraries adjusting the learning commons model to adapt large, open spaces into a series of boutique spaces, creating different atmospheres that support different kinds of work and learning styles. This will include appropriate amounts of silent and quiet individual study spaces, and it will be flexible enough to be modified by patrons to create the space they need, whether that is a group collaboration space or a small bubble of privacy and quiet in a public space.” (Hegde, Boucher, & Lavelle, 2018, p. 912)

Types of Spaces

Furniture selection and arrangement should be tailored to fit the desired use of the space. While policy can be used to suggest space usage, furniture itself has a powerful impact on the types of activities seen as appropriate in a space.

For the purposes of this report, we will borrow from the literature a classification of spaces that combines the desired noise level of the space with the visual and aural privacy afforded by the space

(Andrews et al., 2016; *Insights, Applications + Solutions: Active Learning Spaces*, 2014; Wang, 2019). The classification results in four types of spaces: public/together (noisy open spaces), private/together (group study rooms), public/alone (quiet open spaces), and private/alone (quiet, individual study rooms).



The following sections outline three groups of suggestions from the literature that may be worth considering when reviewing DUL study spaces: design suggestions for large, open spaces; issues related to mobility, and issues related to large social groups in the library.

Large Open Spaces

The literature suggestions that design of open study spaces in libraries can be quite tricky. It is true that students often come to the library to be surrounded by other people who are engaged in contemplative study, which acts as a sort of social pressure to be studious (Broughton, 2019). Large, open study spaces, however, present privacy challenges to solo studiers. Students, especially those from historically minoritized groups, do not want to feel on display in library spaces (Hedge, et al., 2018; Mohanty, 2002; Gibson & Hughes-Hassell, 2017; Broughton, 2019). They are often subjected to increased scrutiny from other students, library staff, and security staff, and if made to feel that they do not belong in library spaces, they can experience many negative outcomes to their health, wellbeing, and success in an academic environment.

It is not only solo studiers who have trouble with open spaces. At times, even study groups feel awkward making noise in a large open space (Hegde et al., 2018; Wang, 2019). Doing group work in an open space puts the group on display, especially if others in the space are currently studying quietly. Once noise begins in an open space, however, it can spread around the library quickly, both by changing the

impression of the purpose of a space and by forcing others to increase volume to be heard over existing noise (Bird & Puglisi, 1984).

Different types and arrangements of furniture are recommended for open spaces with different noise norms. For example, Andrews et al. (2016) found that “long tables and task chairs indicated that the reading room was for traditional study, while mobile tables and chairs defined the collaborative center” (p. 659). But even after dividing the open spaces up into noisy and quiet spaces, each type of space will still need some variety in furniture types and arrangements.

For noisy open spaces (public/together), use furniture to encourage socializing and group work – for example, circular tables or circular arrangements of comfortable seating (Luyben, Cohen, Conger, & Gration, 1981; Mohanty, 2002). Group privacy in noisy spaces can be supported by privacy-controlling furniture like partitions or whiteboards or with clever furniture placement – for example, alternating heights of furniture, alternating the direction furniture groups face, etc. (Andrews et al., 2016; Wang, 2019).

For quiet open spaces (private/together), the same practice of alternating heights and direction of furniture can improve visual privacy. For example, long study tables can be interwoven with carrels (Andrews et al., 2016; Mohanty, 2002; Wang, 2019). This reduces the likelihood that solo studiers at tables will feel on display and that the carrels will be clustered in large and tightly packed (i.e., privacy reducing) formations. Limiting the density of chairs at tables in private/together spaces better matches the tendency of solo studiers to spread out from each other and also discourages groups from sitting in conversation range (Luyben et al., 1981; Mohanty, 2002).

An additional note on carrels is that, while they afford visual privacy, some carrels have features that can be off-putting to solo studiers. Try to avoid carrels with limited table space and task lighting (Mohanty, 2002; Young, 2003). If the carrel walls are tall or solid, the carrels should have attached lighting that will not cause glare on the screen of a laptop. Another option is to have walls of a material that lets a bit of light through, like fabric.

Finally, quiet open spaces can still be tricky for some students who need quiet but also like a bit of visual stimulation while taking breaks during long study sessions (Mohanty, 2002). Opportunities to look outside through windows may be useful for private/together spaces.

Issues Related to Mobility

There may be furniture styles and arrangements that meet the official requirements for ADA compliance but that present problems for patrons with mobility issues. For example, one study found that a library’s desktop computers were too densely packed for users with mobility issues (Pontoriero & Zippo-Mazur, 2019). While not every piece of furniture has to suit every patron, public computing is a special service

and should be reviewed to ensure that there is sufficient space around terminals and perhaps a variety of seating options (more below). Members of this team also have received complaints from users about the inclusiveness of our spaces to people with disabilities, despite being compliant with regulations.

Another issue that should receive attention is whether we offer tables of varying height for all of our major services. Help desks, assistive equipment, computer terminals, print release stations, etc. should each have multiple table height options for users who either need to be sitting or can't be sitting (Cruz, 2019; Pontoriero & Zippo-Mazur, 2019). Easy to remove chairs can support the use of low tables by both people who use wheelchairs and people who need to be sitting.

These are just some of the issues that might be presenting problems for patrons with mobility issues or other disabilities. We strongly recommend conducting an in-depth user study focusing on the use of our study spaces by students with disabilities to identify additional issues and appropriate solutions.

Issues Related to Large Social Groups

A final inclusion issue relates to the use of library spaces by large social groups, including groups affiliated with Greek organizations on campus. DUL has had reports of large groups affiliated with fraternities overtaking library spaces and causing disturbances, and these reports are mirrored by similar mentions in the literature (Broughton, 2019; Young, 2003). These situations are very unwelcoming, especially to people who are members of historically marginalized groups, like people of color and people from the LGBTQ+ community (Broughton, 2019).

At DUL, we have had reports of this type of behavior happening especially on the upper and lower floors of Perkins Library. These spaces may be especially prone to this behavior because they are far from staff zones and have large tables that can accommodate large groups. In the future, it may be more appropriate to select solo study or very small group furniture for these spaces, distributed far enough apart to discourage discussions or group activities.

In the past, the preference has been to use the design of a space and simple conventions like posted noise norms to promote pro-social behavior, rather than enact explicit policies that may come across as overly restrictive and originating from a distant library management office. Still, posted policies can be useful for establishing expectations and allowing staff to enforce negative consequences for anti-social behavior. When it comes to the safety and wellbeing of space users, it may be worth considering more explicit approaches that empower students to ask for staff to help address anti-social behavior by groups.

Posted policy signage or other reminders of highlights appropriate and inappropriate behavior can help guide behavior, explain any consequences of policy violations, and empower students to push back against inappropriate behavior (Aarts & Dijksterhuis, 2003). Policies should always be enforced by staff,

however, or they will carry no weight. To ensure policies are being followed without having the library feel too oppressive is a delicate balance, but our survey data show that many students would like library staff to enforce policies and address problematic behavior in library spaces. It may be worth having non-security library staff visit the more remote study spaces regularly to observe behavior and politely remind students of policies when needed. This offers the added benefit of potentially having staff available to help people even when they are not close to a service point. Ultimately, students have the right to feel safe in our spaces, and our failure to address problematic behavior in our spaces may cause them to question our commitment to inclusion.

Noise

Noise policies are a common topic in the comments of our biennial satisfaction surveys. In the 2020 biennial student satisfaction survey, noise was #7 in the list of most frequently mentioned topics, and 72% of those comments were requests (rather than compliments). Of the 215 comments requesting something related to noise policies, the majority seem to be requests for additional quiet spaces or enforcement of quiet policies. Notably, there are a few comments that discuss how noise policies interact with feelings of safety and other issues of identity, including mentions of overhearing discriminatory or derogatory language, the presence of noise as harmful to people with learning disabilities, and the discomfort of overcrowded and noisy spaces. Of course, there are also comments that problematize completely silent environments, indicating that the complete lack of noise can be a source of stress for some, especially in open spaces.

Somewhat paradoxically, the many requests for more quiet spaces may really be a request for more noisy spaces, as suggested by one commenter who noted that the noisy spaces in the library are often crowded and that groups can have trouble finding a place to work. Other comments raise issues of sound-proofing and distances between spaces, suggesting that we have existing quiet zones that cannot practically be kept quiet because of their proximity to noisier spaces.

The issue of noise is one where there is likely no perfect solution. In the following sections, we will share some ideas that may not have been considered, but there is no guarantee that we will be able to design the perfect organization of noise in our study spaces to suit all patrons.

Arrangement of Noisy and Quiet Spaces

Deciding how to designate noise norms for different zones in the library is complex. One issue is whether quiet and noisy spaces can co-exist on the same floor of the library. The literature seems mixed on this issue. Some research insists that quiet spaces and noisy spaces must be on separate floors with complete separation through walls (Franks & Asher, 2014), but some libraries seem to have success blending them on the same floor (Andrews et al., 2016). For blended floors, some studies suggest that it

works to put quiet space in rooms and keep noisy spaces outside (“Quiet vs. noisy patrons: erecting noise barriers,” 1979). Others suggest the opposite – keep noisy spaces in rooms and quiet spaces outside (Bird & Puglisi, 1984).

One aspect to consider in the placement of noisy spaces is the presence of other sources of noise: staff at a help desk, common traffic zones, stairs and elevators, bathrooms, coffee shops, spaces without noise-cancelling features like carpet or low ceilings, noisy machines like printers, etc. (Mohanty, 2002). The presence of these noise sources can signal that it is safe to make noise, so use caution when locating quiet spaces near these areas (Bird & Puglisi, 1984; Both, Heitor, & Medeiros, 2013).

Finally, note that some students may be using library spaces as an informal social space where they can see and be seen while on campus. In these cases, it is a benefit for social/study spaces to be located near entrances and common pathways through the library spaces (Young, 2003).

Service Parity in Noisy/Quiet Spaces

A brief note about service parity across spaces: there are some services that tend to be offered only in noisy spaces, like public terminals. Users may well wish to have access to a public terminal in a quiet and distraction-free space (Franks & Asher, 2014). Consider how this and other services might be offered across different noise zones to suit different study habits.

Enforcement of Noise Norms

Existing literature shows how quiet spaces can feel very constraining and unwelcoming for people of color, and the actions that are needed to enforce quiet can also be employed to further oppress vulnerable and minoritized populations (Gibson & Hughes-Hassell, 2017; Pierard & Baca, 2019; Schomberg & Cole, 2016). Reporting and enforcing of noise policy violations is subjective and can be biased against members of minoritized groups, who may purposely avoid restrictive spaces in fear of such conflict. As Gibson, et al. (2017) remind us, “...many local libraries still employ inappropriate (and arbitrary) codes of conduct that serve to silence and exclude vulnerable groups in the interest of maintaining law and order” (p. 321).

On the other side, however, noise can make others feel unwelcome when groups of students engage in derogatory or oppressive speech. “Sarah, a white senior studying nutrition started by telling me about avoiding certain spaces at certain times in the library where she has encountered groups of people who are loud and talk about sexual conquests, drinking, and drugs. She added, ‘I feel like in a lot of group spaces that happens.’” (Broughton, 2019, p. 7). Failure to enforce policies with members of the dominant culture can negatively impact feelings of safety and belonging among people from historically marginalized groups.

Though libraries are one of the few spaces on campus that offer protected quiet spaces (Pontoriero & Zippo-Mazur, 2019), the increasingly group-oriented work of students has increased the demand for group study spaces. If group study spaces in a library are inadequate to serve the demand, groups without space can infringe upon quiet spaces (Franks & Asher, 2014). Once noise enters a space, it can spread through the space quickly, which has led some researchers to recommend swift (though polite) enforcement of noise policies (Bird & Puglisi, 1984), combined with adequate provision of noisy spaces.

The enforcement of noise norms is a complex issue, but feedback from Duke students and the need to provide a safe environment for quiet study suggests that additional staff monitoring of quiet study spaces may be useful. “Offering students safe, isolated environments as well as monitoring spaces with a visible presence may be help to control large, open spaces” (Broughton, 2019, p. 9). There is some support that even student staff, with training, can be successful monitoring quiet spaces and curtailing noise in a polite manner (Bird & Puglisi, 1984).

Similar monitoring of noisy spaces could alert staff to large groups that are engaging in anti-social behavior, as well as helping staff understand the patterns of noise in spaces. Just as quiet spaces should be reserved for quiet study, it is not helpful for noisy spaces to develop a norm of quiet study; groups should be made to feel welcome to make noise, perhaps by adding privacy-affording dividers or by introducing additional noise sources (e.g., service points, food-related amenities). Another area to explore for communication of norms might be to introduce signage that models the expected behavior in a space, triggering the students’ association between a space and a type of study activity (Aarts & Dijksterhuis, 2003).

Private/Alone

At this time, DUL has spaces that fall under three of the aforementioned space categories: private/together, public/together, and public/alone. DUL does not have widely available private/alone study spaces¹, but evidence suggests that this type of space is very much in need (Andrews et al., 2016; Brunskill, 2020; Cruz, 2019; Pontoriero & Zippo-Mazur, 2019; Young, 2003).

Firstly, private/alone spaces (for example, reservable individual study rooms) benefit patrons who are sensitive to sensory stimuli (sight, sound, smell, etc.) and who need a completely distraction-free environment. (Brunskill, 2020; Cruz, 2019; Pontoriero & Zippo-Mazur, 2019). Even the movement of others through a space can cause distraction, no matter how quiet the space is (Young, 2003).

¹ The current study room policy specifies that groups with reservations have first priority to the rooms. In the past, the system has required two email addresses in an attempt to restrict use of the rooms to groups of two or more. Separately, there is a dedicated solo study space that can be reserved by students who have a formal ADA accommodation letter, but this room has historically been located on noisy floors.

Another group of patrons who benefit from reservable study spaces are people with mobility issues. Our current study spaces require that solo studiers find a study seat by navigating the library until they find an open seat in an appropriate zone. The only reservable spaces are for groups and individuals with interview needs. A person with mobility issues is extremely disadvantaged by this system of having to wander until a space is found, especially if it necessitates changing floors (Brunskill, 2020). Reservable individual seats, perhaps in both noisy and quiet zones, would guarantee that people with mobility issues have a place to study when needed and would allow them to travel directly to that space.

One way to offer private/alone space in our existing study spaces would be to convert the group study rooms on quiet floors to reservable individual study spaces. Group study rooms on quiet floors contribute to noise pollution on those floors – the walls to the rooms are not soundproof, and groups entering and leaving rooms or wandering floors looking for open rooms can introduce noise into the space. Unfortunately, these rooms are often near stairways and elevators, which could be a source of distraction. Also, many of these rooms may seem too large to offer to single users, but in the absence of other options, this would be a good starting point. Other possibilities may be to devote graduate student carrels to this purpose or to build additional semi-permanent isolated spaces in an otherwise quiet zone. This type of service could benefit a large set of users and should be seriously considered.

Aesthetics

The aesthetics of a space have an impact on both use of the space and feelings of welcomeness or belonging. Some recommendations about aesthetic design stem from a review of the literature, while others represent past feedback provided by DUL patrons (students especially).

Something that applies very generally to spaces is the need for intentionality in design. A space with a haphazard appearance - mismatched furniture, furniture layouts that lack regularity, unusual combinations of aesthetic styles and visual accents - affect students' willingness to spend time in a space and contribute to the upkeep of that space. We hear regular positive feedback about campus spaces with cohesive and intentional design, like the modern designs of newly renovated library spaces or the classic designs of our traditional reading rooms. In our spaces with less intentionality, where mismatching furniture is organized in disconnected groupings and there is limited visual cohesion, students complain about both the style and also the cleanliness of the space. It is perhaps a combination of the design of the space and the lack of staff presence that contributes to reports of aggressive behavior and feelings of unwelcomeness in these spaces.

Beyond simple intentionality, however, is the need for variation in aesthetic choices. Our users frequently comment on aesthetics in our spaces, but they do not always agree or have the same preferences. While it can be tempting to adopt a “neutral” aesthetic design to try to find a common denominator across all people, we know with certainty that students do not perceive these choices as

neutral. Similar feedback appears in a study by Hegde et al. (2018). “Respondents talked about the ‘colors’ of the space in terms of their brightness/warmth and the energy that they provide, as well as distaste for white walls given their ‘institutional’ feel” (Hegde et al., 2018, p. 910-911).

Students may use the word drab or bland to describe our spaces, but those words are still attached to reports of feeling unwelcome. Especially problematic are spaces with both neutrality and formality. Students who identify as having energy and personality can feel actively excluded by spaces that seem to impress on them a need to be serious, quiet, reserved, and proper. They see the spaces as being designed for someone who is most definitely not them.

As with other areas of space design, we see this as evidence that **we should be providing spaces that employ a variety of aesthetic choices**. We should make efforts to be inclusive of a variety of different aesthetic tastes so everyone has a space where they feel welcomed and that they belong. A related area is the choice of art and artifacts used within the space. Research has shown the importance of representation in art and artifacts for helping minoritized groups feel welcome (Conner, Reinhart, Thomas, & Tumolillo, 2021). While varying aesthetics, we should also make sure we vary the representation of different segments of our community throughout all of our spaces.

The use of color in spaces can raise complex issues. Different colors have different cultural meanings, and different individuals react very differently to different colors. For example, bright color schemes may be a distraction for some and trigger migraines in others, while some may feel energized by those same colors. Muted colors may be difficult for those who suffer from depression but calming for others. Again, the answer seems to be variety and intentionality.

Food/Drink

The availability of food and drink can also be polarizing to our students. Some patrons are especially sensitive to the smells or noises associated with food. Providing food-free environments, as we do currently, provides some protection from those distractions. The addition of completely distraction-free solo study spaces would likely be necessary to meet the needs of some users.

For others, access to food and drink while studying is crucial to their academic success or even their health. Consider, for example, students who have health issues and need to either eat regularly or take medicine with food (Pontoriero & Zippo-Mazur, 2019). Likewise, for people with mobility issues, being able to eat and study in the same place would reduce the need to change locations over the course of a study session.

While in the normal course of operation most of our study spaces allow food, we do not provide the most inclusive of environments when it comes to food. For lower income and non-traditional students,

the library may represent one of the few places where they can study with ample space and limited distractions with no expectations of making a purchase (Couture et al., 2021). Certain food-related amenities in libraries have a higher impact on these students because it is harder for them to commute back and forth between home and campus, and they may not be able to afford to purchase food while on campus. Offering amenities like access to a microwave and a refrigerator can be a huge source of support for these students.

Signage

Signage is a mandatory part of making any library feel welcoming. Signage is used in libraries to help patrons navigate our spaces and materials, understand our policies, mark our meeting rooms and amenities, give instructions on how to use our equipment, etc. Both the style and content of our signage have an impact on the inclusiveness of our spaces.

Navigational signage has been explored in a previous signage assessment, published internally. The findings show that many of our spaces are invisible from the main navigational pathways and that we should have large, clear navigational signage available at major transition points in the libraries. While usage of our kiosks for wayfinding has not been investigated deeply, a preliminary proposal (also published internally) suggests adding or moving kiosks to places where patrons are likely to be looking for help, especially with wayfinding.

With any signage, the quantity of text should be as low as possible, and the text should avoid unusual phrases or jargon. Rather than expecting patrons to understand how a library works already, signage should attempt to document the “unwritten rules” – for example, who is permitted to use the various spaces in our libraries. Non-verbal content like pictures or icons can reinforce concepts. Colors and layout, however, should be kept simple. There are neurodiversity concerns with designs that have bright, contrasting colors and cluttered layouts (Pun & Owen, 2019).

Signage in multiple languages should also be considered. A multilingual glossary maintained for libraries may be helpful (State Library of New South Wales, 2021).

Using large, sans serif font is always best (never smaller than 16 point). ADA requirements include using fonts such as Helvetica, Futura, Eras, Optima, Avant Garde, Trebuchet, Verdana, Vag Rounded, Franklin Gothic, or Frutiger. The finish should be non-glare and characters and symbols must contrast with background. Height should be 60 inches from centerline of sign to the finished floor.

Some people find talking to a person more helpful than signage, especially due to multiple naming structures in the libraries and on campus in general. In this case, helping the patron find staff may still require signage. Mobility issues can make it very difficult to obtain help when far away from a service

desk. Some signage has already been added to prominent locations in the Perkins and Bostock buildings to highlight our chat and phone number options for reaching staff, but additional locations for this information may be useful (for example, embedded in stacks or directory signage).

Websites about Spaces

Students' sense of belonging in a space is crucial to their success, and libraries need a variety of spaces to promote that belonging. As part of providing spaces, though, libraries need to facilitate students' ability to find the spaces that work for them (Broughton, 2019). For people with disabilities especially, library websites should document spaces in detail so patrons can understand what spaces they will encounter in advance (Brunskill, 2020).

Brunskill (2020) suggests that library websites about spaces should include the following content:

- details about navigating physical spaces (maps, floorplans, photos)
- sensory information for spaces (noise, privacy, lighting, chemical sensitivity)
- physical building accessibility
- parking/transportation information
- disability services contact (with name, contact form)
- assistive technologies hardware and equipment
- any accessibility problems with spaces

When advertising services intended to assist people with disabilities, note that some accommodations and services are helpful for multiple groups or even for everyone. For example, "...the majority of the libraries that offered retrieving materials services indicated that these services were intended for library users with mobility concerns, but participants in this study with anxiety, depression and attention disorders also articulated that they would find these services helpful" (Brunskill, 2020, p. 781). Trying to advertise such services to a single group of patrons may exclude others who would benefit from the same service.

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