



Research Article

User-focused, User-led: Space Assessment to Transform a Small Academic Library

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Received: 13 July 2017

Accepted: 23 Oct. 2017

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Abstract

Objective – By collecting and analyzing evidence from three data points, researchers sought to understand how library spaces are used. Researchers have used results for evidence based decision making regarding physical library spaces.

Methods – Undergraduate researchers, sociology faculty, and librarians used mixed-methods to triangulate findings. Seating sweeps were used to map patrons' activities in the library. Student-led focus groups discussed patterns of library use, impressions of facilities, and library features and services. The final step included a campus survey developed from seating sweeps and focus group findings.

Results – Seating sweeps showed consistent use of the library's main level Learning Commons and upper level quiet spaces; the library's multipurpose lower level is under-utilized. Students use the main level of the library for collaborative learning, socializing, reading, and computer use. Students use the upper level for quiet study and group work in study rooms. Focus group findings found library use is task-specific. For example, a student may work with classmates on a project using the main level Learning Commons during the day, and then come back at night to use the quiet floor for test preparation. Survey responses highlighted areas in which the library is deficient. For example, respondents cited crowdedness, noise levels, and temperature concerns.

Conclusion – These data offer empirical evidence for library space needs. Some data aligns with previous space studies conducted at this library: access to power outlets, lighting, noise, and an outdated environment. Evidence also supports anecdotal concerns of crowding, graduate students lacking designated study space, and the need for quiet study space *away* from group study space.

Introduction

Established in 1975 as the sole library for the St. John Fisher College, Lavery Library serves a campus of approximately 3800 students, including undergraduate, masters, and doctoral. The College is primarily an undergraduate institution with a growing graduate population. At the same time, the library has witnessed a slow but dramatic shift in the way users work in physical library spaces. The library uses daily headcounts and gate counts to improve library spaces. The library also conducted several space studies over the past decade to inform small-scale physical changes and better accommodate changing user needs. Renovations since 2012 include a Learning Commons, the creation of a multi-purpose space (Keating Room), a space with cafe-like seating, and additional outlets.

Through strategic weeding, the library has enlarged study spaces. Recent changes include the addition of easily movable tables and soundproofing quiet floor doors. These changes are welcomed by the campus community, but formal and informal feedback from the students provides a clear and consistent message: the library must continue to keep pace with their changing space needs in order to maintain a high standard of service.

The library is three levels, with users entering on the second (main) level. This level houses the Keating Room and Learning Commons, which includes group workstations with large monitors, desktop computers, and a variety of tables and chairs for groups and individuals. The lower level includes group work tables and two classrooms, one of which is a computer lab.

The upper level is the quiet floor, the only floor with a noise policy. There is a variety of seating, including individual study carrels, small and large tables, individual and group study rooms, and two reservable meeting spaces. The library is also home to other campus departments (e.g., Career Center, Academic Opportunities Program Office, Office of Information Technology, and others), which were not a focus of this study.

Literature Review

Library as Place

With a shift from print to electronic collections, libraries have reinvented themselves as flexible learning spaces with a focus on community. The phrase *library as place* best describes how students use the library as a flexible, dynamic space adaptable for changing needs (Freeman, 2005). Other studies discuss how students continually remake spaces to fit their needs to support their learning (Fallin, 2016; Hanson & Abresch, 2016). Montgomery (2014) refers to the library as a place for informal learning, where students can set their own goals and determine their needs. The library is thought of for its study spaces and less for services and collections (DeClercq & Cranz, 2014; Hall and Kapa, 2015). A place to gather and have conversations, according to Oldenburg (1997), is an important part of learning; the library has begun to be this place. As a result of this flexibility and community building, academic library users, particularly students, see the library as a “third space” (DeClercq & Cranz, 2014)—a place neither classroom nor residence hall. Academic work and socializing takes place within third spaces, and “library as place” fills the need for this third space.

Space Attributes

Whether it is quiet study space or an open meeting space, the reasons how and why users select library spaces largely depend on individual needs and activities (Cha & Kim,

2015; İmamoğlu & Gürel, 2016; Khoo, Rozaklis, Hall, Kusunoki, & Rehrig, 2014; Montgomery, 2014; Vaska, Chan, & Powelson, 2009). Research focusing on students’ requirements of library spaces reveal common themes: more natural light, larger or more tables and chairs, and more outlets (Andrews, Wright & Raskin, 2015; DeClercq & Cranz, 2014; İmamoğlu & Gürel, 2016; Khoo et al., 2014; Montgomery, 2014; Vaska et al., 2009). Library spaces must also accommodate simultaneous device use by students (Ellison, 2016; Ojennus & Watts, 2017). Similarly, research indicates the need for collaborative spaces that can accommodate a variety of technologies (Andrews et al., 2015; Given & Archibald, 2015; Freeman, 2005; Lux, Snyder, & Boff, 2016). At the same time, Goodnight and Jeitner (2016) focus on the desire for quiet, because students “come to the library searching for spaces that are quiet, where they can settle down to read and study and write their papers in silence, without distractions . . .” (p. 219) from others. Similar research also notes individual study carrels and quiet spaces are valued (Hall & Kapa, 2015; Montgomery & Miller, 2011; Ojennus & Watts, 2017; Oliveira, 2016).

Group Study and Non-Quiet Spaces

Non-quiet space in the library—for example, group study rooms and flexible learning spaces—are ideal for many library users, as indicated by Freeman (2005). Recent literature shows the need for more of these spaces, and that students respond positively to redesigns which provide more flexible learning and group study spaces (Cha & Kim, 2015; Given & Archibald, 2015; Khoo et al., 2014, Montgomery, 2014). Studying alongside others provides visual and social pressure for students, furthering the communal space (Andrews et al., 2015). There is a need for libraries to create spaces where users can collaborate, socialize, and study alone and alongside others (Andrews et al., 2015; DeClercq & Cranz, 2014; Freeman, 2005; Montgomery, 2014; Montgomery & Miller, 2011, Ojennus and Watts, 2017).

Quiet and Individual Study

Research indicates students use quiet areas to accomplish serious work (e.g., to study for exams or write papers) (Cha & Kim, 2015; DeClercq & Cranz, 2014; Freeman, 2005; Khoo et al., 2014). Even during individual study, students often indicate their desire to be near others studying (Andrews et al., 2015; Applegate, 2009; Goodnight & Jeitner, 2016; Hall & Kapa, 2014; İmamoğlu & Gürel, 2016; Montgomery, 2014). Yet, students still desire ample personal space, feeling a space is full when 40-50% of seats are occupied (Applegate, 2009; İmamoğlu & Gürel, 2016; Khoo et al., 2014). Physical dividers would allow users to delineate personal space and minimize distractions so that they can work most effectively (İmamoğlu & Gürel, 2016).

Aims

The purpose of this study is to examine and analyze how students use library spaces. Collected evidence will be used to plan space renovations, both small and large. Additionally, collected evidence will improve understanding of what works, what does not work, and what is needed in the library.

Methods

This study used multiple methods to triangulate findings and provide a clearer understanding of how library spaces are used. Methods included seating sweeps, focus groups, and survey. Research was conducted with Institutional Review Board (IRB) approval.

Seating Sweeps

Seating sweeps were based on Given and Leckie's 2003 study, "'Sweeping' the Library: Mapping the Social Activity of the Public Library." Librarian researchers trained three permanent library staff members to assist with completing sweeps. Data was collected floor-by-floor with printed maps and a clipboard (See

Appendix A). They were conducted three times a day for two non-consecutive weeks during spring 2016. The first sweep took place in February, just before spring break; the second was in April, a few weeks before finals. Sweeps were conducted at 9 A.M., 1 P.M., and 8 P.M. to create a snapshot of user behaviours throughout the day, and took between 15 and 60 minutes depending on busyness. Staff recorders noted user activities and personal items, such as use of a desktop, laptop, cell phone, tablet, or whiteboard; and if they had food or drink. Recorders also marked if users were conducting group work, note-taking, reading, sleeping, talking, or performing other noteworthy activities. For instance, recorders captured when individual users occupied entire tables intended for multiple people, or when users dragged cords across aisle ways to reach outlets. Interested in users' willingness to move larger furniture, librarian researchers purposely left furniture placement off the map in the multi-purpose Keating Room so recorders would be able to draw changes to configurations of the space. To minimize intrusiveness, recorders maintained a reasonable distance from users. The clipboard also included a sign stating that a library space study was in progress in order to inform users but hopefully not discourage or change user behaviours. Data from the coded maps were entered into a Google Form for analysis.

Focus Groups

After seating sweeps were completed, student researchers and sociology faculty advisers joined the research team. Faculty advisers trained student researchers to conduct focus groups. Focus groups were organized by class year (9 freshmen, 9 sophomores, 10 juniors, 8 seniors, 2 masters, and 3 doctoral students) totaling 41 participants. Student researchers recruited undergraduate participants by invitation; liaison librarians recruited masters and doctoral participants by emailing targeted classes. Participants were offered pizza and the chance to win a prize as an incentive. The

research team developed questions based on past local space surveys and sweeps data. Librarian researchers and faculty advisers were not present at the focus groups in an effort to minimize their influence on participants' responses. Each undergraduate group was asked the same set of questions; these questions were altered slightly for masters and doctoral students. Student researchers took notes of participants' responses, and after the focus groups were completed, the research team came together to analyze findings. Focus group data were reviewed for common themes by each researcher independently, and schemas were developed as a team to help inform survey development.

Survey

The research team developed questions based on findings from seating sweeps and common themes from library focus group data. Qualtrics was used to build and distribute the completed survey (See Appendix B). As with many institutions, students have survey fatigue on our campus. In order to keep the survey short and increase response rate, the research team opted not to include demographic information in the survey. Prior to distribution, faculty advisers and student researchers piloted the survey with a small group of undergraduates. Researchers decided to exclude masters and doctoral students due to their low participation in focus groups and a lack of relevant data.

All undergraduates (N=2948) received the survey via email. To improve response rate, the survey was emailed to students through the well-recognized and respected Student Government Association (SGA). Respondents completed the survey anonymously, with the caveat that if they wished to enter a drawing for a \$100 Amazon gift card, they needed to provide their name and email address. A separate survey allowed respondents to enter the drawing, which allowed the research team to maintain confidentiality of responses. The survey ran for three weeks with two reminder

emails, sent through the Qualtrics platform, to those who had yet to complete the survey. The overall response rate was 12%.

Results

Seating Sweeps

Findings from seating sweeps helped visualize occupancy patterns and user behaviours. Existing library data shows the busiest time is the 1 P.M. hour Monday-Friday, which is consistent with seating sweep findings. Data from sweeps revealed the main level to be the busiest, followed by the upper level (see Table 1). Tables meant for 4 people were observed with only 1 person spread over the entire surface 12% of the time, effectively making the space fully occupied. This data is consistent with survey findings regarding crowdedness. At the same time, the lower level occupancy rate was less than 1% during sweeps, despite being a non-quiet space.

Behaviours recorded during sweeps indicated the library is a multipurpose, adaptable space, similar to other research. A key finding from the sweeps showed 10% of users were settling in or making themselves at home in their claimed spaces: using bean bag chairs to get comfortable, adjusting lighting, taking off their shoes, sleeping, and abandoning belongings for extended time. Findings from sweeps also observed 40% of users eating or drinking, another indicator of the library being a flexible third place. Data also showed users crowding around a single computer monitor for collaborative work rather than making use of collaborative group workstations and their larger monitors, with the latter noted only three times. Students made frequent use of flexible furniture in the library, especially in the Keating Room. Findings from sweeps showed students use the movable whiteboards for their intended use (studying), but interestingly, also as barriers to create privacy. Observed behaviours related to technology confirmed informal feedback regarding the need for more outlets and power.

Table 1
Combined Average Occupancy of Patrons by Floor during Seating Sweeps

	9a.m.	1p.m.	8p.m.
Lower Level	2.5	9	11.6
Main Level	24	91.1	67.6
Upper Level	12.3	42.6	33.1

During sweeps, 41.5% of users were recorded simultaneously using at least two electronic devices, creating a higher demand for power and technology options in the library.

Focus Groups

Findings from focus groups provided better understanding of what users think about library spaces, including their intended use and desire for these spaces. Common uses for the library included studying, computer use, printing, and working on group projects. These results were common among all focus groups. Common responses when asked about well-liked library services and features included: interlibrary loan, librarians and the Research Help Desk, and group workstations for easier collaboration. When asked about services or features they would like to see added, common responses included a stress relief room with nap pods, extended hours, and additional quiet floor study rooms. Participants requested smaller, 1-2 person tables for independent work, stating once they set up at larger tables other students appear dissuaded from joining the table. Participants suggested extended hours, with a few participants stating the library should stay open 24 hours or at least until 3 A.M.

Findings revealed differences in how undergraduate commuters and residents use the library. Commuters indicated coming to the library most often between classes to connect

with friends, not to engage in serious work. As with many participants, commuters mentioned choosing somewhere on the quiet level when coming to the library for serious work. Residents use dorm lounges or their rooms for work and use the library for printing or socializing. For group work and projects, both commuters and residents commonly use library spaces, but stated the lack of privacy on the main level and the noise policy on the upper level can be frustrating. Undergraduate students mentioned the breakout rooms available in other buildings are ideal spaces for this type of work.

Focus group questions for masters and doctoral students differed slightly than those asked of undergraduates. These participants' responses revealed differences in library use, including primarily using the library for research purposes. Most stated using librarians as helpful resources when conducting research, and were more emphatic in their responses regarding use of the Research Help Desk. Two participants completed undergraduate degrees at St. John Fisher College, and indicated their library use as graduate students is much more academically oriented.

Survey

The survey provided data for how undergraduates self-reported using library spaces in relation to focus groups and sweeps data. Respondents reported using Main Level – open area and the Keating Room (tutoring)

spaces 45.57% and 8.89%, respectively, “very often”. Respondents self-identified using quiet floor open areas and study rooms “very often” 31.65% and 36.39% of the time, respectively. The main level is the most self-identified used space, with the upper level spaces closely following. Survey results find the library’s lower level (basement) is underutilized, with basement – computer lab and basement – tables “never” being used 49.05% and 50.95% of the time, respectively. Figure 1 provides a breakdown of library spaces and their frequency of use by respondents. Monday-Thursday and Finals Week are the most popular times in the library: 45% of users stated they come to the library “very often” Monday-Thursday, and 57% of users indicated that they come to the library “very often” during Finals Week. Nearly 50% of respondents think the library needs extended hours, which is similar to findings from focus groups; however, just under 40% of individuals indicated coming to the library “very often” in the evening.

In addition to revealing what spaces respondents reported using most frequently,

they also shared which spaces are deficient (see Figure 2). As previously noted, the quiet floor and its private rooms are extremely popular, and unsurprisingly, 69% of respondents requested additional private rooms. Also unsurprisingly, respondents said the library needs more outlets (60%) and tables (41%) throughout the library. The need for more outlets and tables has a strong relationship to findings of computer use and group work, with 52% of respondents using computers and 64% of respondents “sometimes” conducting group work in the library. Overall, respondents are mainly interested in conducting academic-related activities in the library. Even so, a high percentage of respondents requested the addition of stress-relief features such as nap pods and massage chairs, as well as Grab ‘n Go foods.

Survey results regarding noise levels and temperature shed light on students’ individual perceptions of spaces. When asked if the library is “too noisy,” 62% of respondents indicated the library was “sometimes” too noisy, which parallels findings of crowdedness, as 64% of

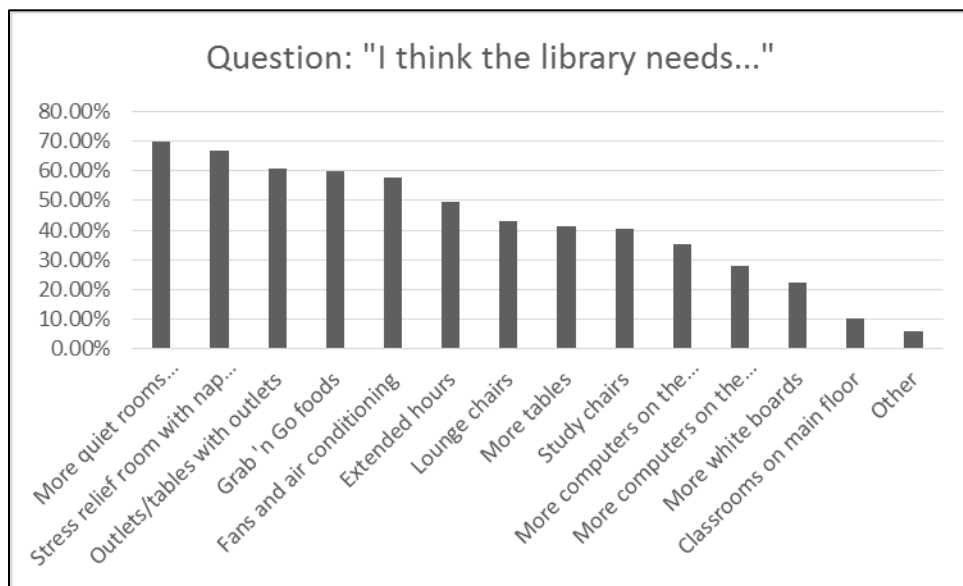


Figure 2
Response to survey question: “I think the library needs . . .”

respondents indicated the library was “sometimes” too crowded. Despite the majority of respondents indicating that the library is “sometimes” too noisy and “sometimes” too crowded, noise and crowdedness may not always be related. This lack of correlation may be due to the time of day a student uses the library. For example, the 1 P.M. hour is extremely crowded and noisy, whereas the 8 P.M. hour might be crowded but relatively quiet. Regarding temperature, when responding to the statement “I think the library needs . . .” with a list of options users could check (see Figure 2), 58% selected “Fans and air conditioning.” There was some relationship between this finding and the library being too hot: 34% felt the library was “very often” too hot and 44% felt the library is “sometimes” too hot, while 64% felt the library is “never” too cold.

Discussion

Library as Place

Common themes from space-related literature are echoed in this study’s findings. As with Freeman (2005), Lavery Library created flexible spaces, providing moveable, lightweight furniture for users to create their ideal study environments. During sweeps users were consistently observed moving tables, chairs, and whiteboards to create such environments, leading researchers to infer users are comfortable enough in the library to make spaces fit their needs (Montgomery, 2014). Further, observed users exemplified “library as place” by lounging in beanbag chairs, adjusting lighting in study rooms, taking off shoes, sleeping, and using headphones. Whether headphones were used as noise dampening or for watching videos was not captured, and focus group participants only mentioned their appreciation of headphones available for checkout and earbuds for purchase at the Checkout Desk. Additionally, observations suggested a high level of comfort in the library and with each other; users frequently abandoned belongings. This may also be a

means to save their spaces when the library is crowded.

Students make use of flexible learning spaces, moving tables and chairs as needed to accommodate their needs. A good example of this is students consistently moving tables and chairs in the Keating Room. The maps used for the sweeps purposefully left furniture placement off the map so recorders would be able to draw daily configurations of the space. While the space never changed dramatically, there were small changes, including the rolling white boards. The idea of collaborative, flexible study spaces, where students are able to work together, have been the main focus of recent updates to library spaces over the last 10 years. As other researchers have noted, these spaces support student learning, including collaboration, social learning, and alone-together study (Cha & Kim, 2015; Given & Archibald, 2015; Khoo et al., 2014; Ojennus & Watts, 2017). Interestingly, focus group participants repeatedly said they like the group work stations for completing group work, yet users were rarely using these tables as intended during sweeps. More often, users at these tables used the integrated outlets to power their laptops, leading the research team to believe students like these tables more for their outlets and less for the ability to share a screen.

Demand for a stress relief room and nap pods signals that while users come for serious work, they feel the library should, or could, serve as a comfortable, relaxing environment, indicative of the “third space” discussed by DeClercq and Cranz (2014). Focus group and survey results revealed undergraduates frequently come to the library before classes or after dinner for printing and academic work, while they come in between classes for group work and socializing. Despite low participation in focus groups, graduate students unsurprisingly indicated their use of library spaces is almost wholly academic, citing a need for quiet and a fondness for academic-oriented library services. Students’ motivations for library use need to be considered for any

library planning renovations and new services, especially when faced with increasingly diverse student populations. This is something Lavery Library must take into account given our increasing graduate population.

Space Attributes

Students use library spaces for a variety of reasons; most commonly, data revealed users come to the library for academic work. Space needs differ among users and are often task-dependent, with both individual and group work requiring a variety of furniture options. Independent of group or individual study spaces, more table and seating options are a common theme within focus groups and survey findings, aligning our students' desires with other research on space attributes (Cha & Kim, 2015; İmamoğlu & Gürel, 2016; Khoo et al., 2014; Khoo, Rozaklis, Hall, & Kusunoki, 2016; Montgomery, 2014; Vaska et al., 2009). Regardless of space preferences (i.e., quiet vs. non-quiet), users consistently and whenever possible need additional outlets, aligning with research regarding the need for additional power to accommodate technologies (DeClercq & Cranz, 2014; İmamoğlu & Gürel, 2016; Khoo et al., 2014; Montgomery, 2014; Vaska et al., 2009). The need for more outlets, aside from the building's age, may stem from multiple, simultaneous device use (i.e., laptop, cell phone, desktop) found in sweeps data. Builders in 1974 could not have predicted the pervasiveness of technology today, but future renovations must address power capacity.

The library's main level is a mix of desktop computer pods, group workstations, lounge furniture, and other flexible spaces, and is frequently abuzz with students working on group projects, studying together, and socializing. It is also where the Checkout Desk and Research Help Desk are located; these two desks are frequently busy with library users seeking assistance with research, utilizing technology, checking out materials, and performing other activities. The main level is

certainly what Freeman (2005) would consider "the sound of learning" (p. 5), with sweeps, focus groups, and survey responses indicating the library is used frequently for group work. However, the main level does have its drawbacks for group work. For example, it is possible group workstations are not as frequently used as intended due to a lack of privacy. Based on focus group findings, group workspaces should be addressed in library renovations, specifically the addition of break-out rooms or other semi-private spaces with soundproofing.

Particularly surprising throughout all phases of research is the under-use of the lower level. This is a mixed-use, flexible space where talking is allowed, but is typically quieter than the main level. Occupancy during sweeps was less than 1% and students rarely mentioned the lower level during focus groups. This trend continued in survey responses, with approximately 50% of respondents "never" going to any lower level spaces (i.e., "Basement- computer lab" and "Basement- tables"). Understanding why students are not using this available space would be extremely valuable. As Khoo et al.(2016) mentions, spaces without defined use conventions are considered full when they are relatively unoccupied, as individuals are unlikely to join a space already occupied by another individual. In the case of the lower level, this might be doubly true, as the classrooms on this level are not commonly used outside of instruction and students may be unaware of when they are able to, or not able to, use these rooms. Other factors contributing to underuse could be the lack of natural lighting, undefined policies regarding noise, and temperature. The only available lighting in the lower level is fluorescent lighting; there are no desk lamps and only one semi-hidden space with windows. While the only designated quiet space in the library is the upper level, the lower level is much quieter than the main level. Lastly, underuse may be a result of temperature variance, something noted in the focus groups and survey findings.

As with other research (Cha & Kim, 2015; DeClercq & Cranzen, 2014; Freeman, 2005; Khoo et al., 2014, Khoo et al., 2016), our students are looking for a quiet space to “get serious” (e.g., write research papers). This is especially true for masters and doctoral students, including one doctoral student wishing the library would be more like a neighboring academic library, where the entire space is quiet. This population’s need for quiet space may stem from different academic requirements (e.g., dissertation research), or the need for quiet space outside of home or work. Not surprisingly, many undergraduates indicated a desire for quiet space as well, specifically when concentration is required, as the library main level can be noisy. What is particularly interesting, especially in lieu of survey results, is upper level sweeps have only about 20% occupancy, even during peak usage. It is possible students see the space as full at 20% occupancy, rather than the 40-50% reported in other literature (Applegate, 2009; İmamoğlu & Gürel, 2016; Khoo et al., 2016). For example, once a study room has one person using the space it is considered full, even though there may be 2-3 available chairs in the room. Similarly, as noted in the sweeps and focus groups, a single student may use an entire four-person table, making the space full with only one occupant. İmamoğlu and Gürel (2016) write about territorial dividers as a way to maintain personal space, and something focus group participants mentioned wanting were smaller, individual work tables in place of the large four-person tables currently available. This follows trends for communal study, or alone-together study, where students seek silence lacking in other areas (e.g., dorm rooms, classrooms, residence hall lounges, and others), but still want to be around others working on similar tasks. It is clear from all three data points that quiet study space is highly valued and sought after on campus, and the library, while providing some quiet, still requires more to meet demand. This is consistent with recent literature about growing demands for quiet spaces, and libraries should consider this

growing body of evidence as they plan for renovations.

Space-related services

While not solely library-related, participants in all areas of research suggested the library add café and stress-relief services. Café service was not surprising given the percentage of people observed during sweeps with food or drink. As the survey found, students frequently visit the library between classes and throughout the day and Grab ‘n Go foods was rated highly as a need in the survey (see Figure 2), having café access would benefit students. This leads researchers to conclude current vending options are inadequate, including the new single-serve coffee machine. Out of a specific request for nap pods within the focus groups, student researchers included an option of “*Stress relief room with nap pods/ massage chairs/ stress relieving activities*” for the survey question “I think the library needs...” Surprising to librarian researchers, the request for stress relief services came in second to “more quiet rooms.” Considering the other spaces on campus in which students elect to study and complete work (e.g., cafés, residence hall lounges, and more), the desire for space-related services, including Grab ‘n Go foods and stress relief rooms, is very important.

Extended hours and interlibrary loan are two other services frequently mentioned in both the focus groups and survey. The request for extended hours has persisted for years, and the library has adjusted hours to open earlier and close later on weekends, including staying open until 2 A.M. during the last two weeks of the semester. The study did not determine what extended hours would mean to users, but existing headcount data does not support a need for extended hours. We acknowledge this could be due to students knowing the library is closing, and therefore moving to an alternate location long before closing. Unrelated to library space, praise for interlibrary loan was common throughout all user types in the focus groups.

Researchers are unsure why this service connects to library spaces for users, though it is possible students have picked up physical interlibrary loan materials at the Checkout Desk, or focus group questions about space-related library services evoked positive feelings toward this service.

Limitations

The researchers acknowledge this research had limitations. Multiple recorders' interpretations during the seating sweeps may influence data. The librarians conducting the research tried to mitigate this by training staff recorders with a shared understanding of what to record.

Due to low focus group participation, masters and doctoral students were not surveyed. Similarly, a purposeful decision to exclude demographics was made to shorten the survey. Therefore, researchers are unable to relate survey responses back to specific demographic traits (e.g., commuter vs. residential, class level), which may have proved valuable for understanding how different student groups use library spaces.

Future Research

Future space studies should investigate students' need for quiet study spaces, and how libraries may provide these spaces to their students. The need for quiet space may signify a change from previous trends regarding redesigned library spaces. In small academic libraries, would it better serve students to have more quiet spaces than collaborative spaces, since the latter can be found other places on campus? It is also worth exploring students' use of undefined spaces, which may be common in academic libraries.

Acknowledgements

The authors would like to acknowledge others that were instrumental to the success of this library space study: Faculty Advisers: Patricia Tweet, PhD and David Baronov, PhD; Student Researchers: Mollie Flynn and Caroline Villa; and Library staff members: Kate Ross, Marianne Simmons, Brian Lynch, Lynn Seavy, Stacy Celata, and Britta Stackwick.

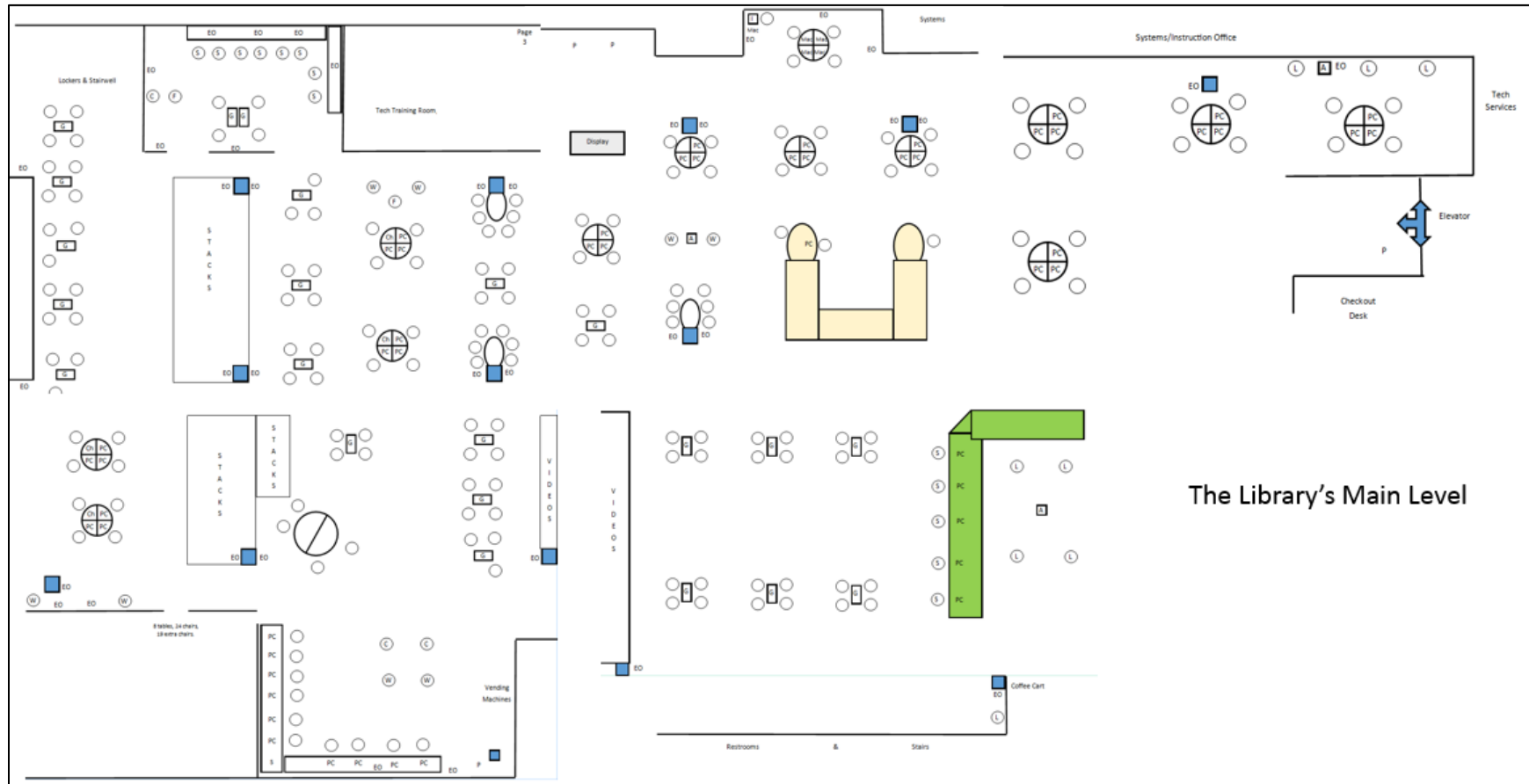
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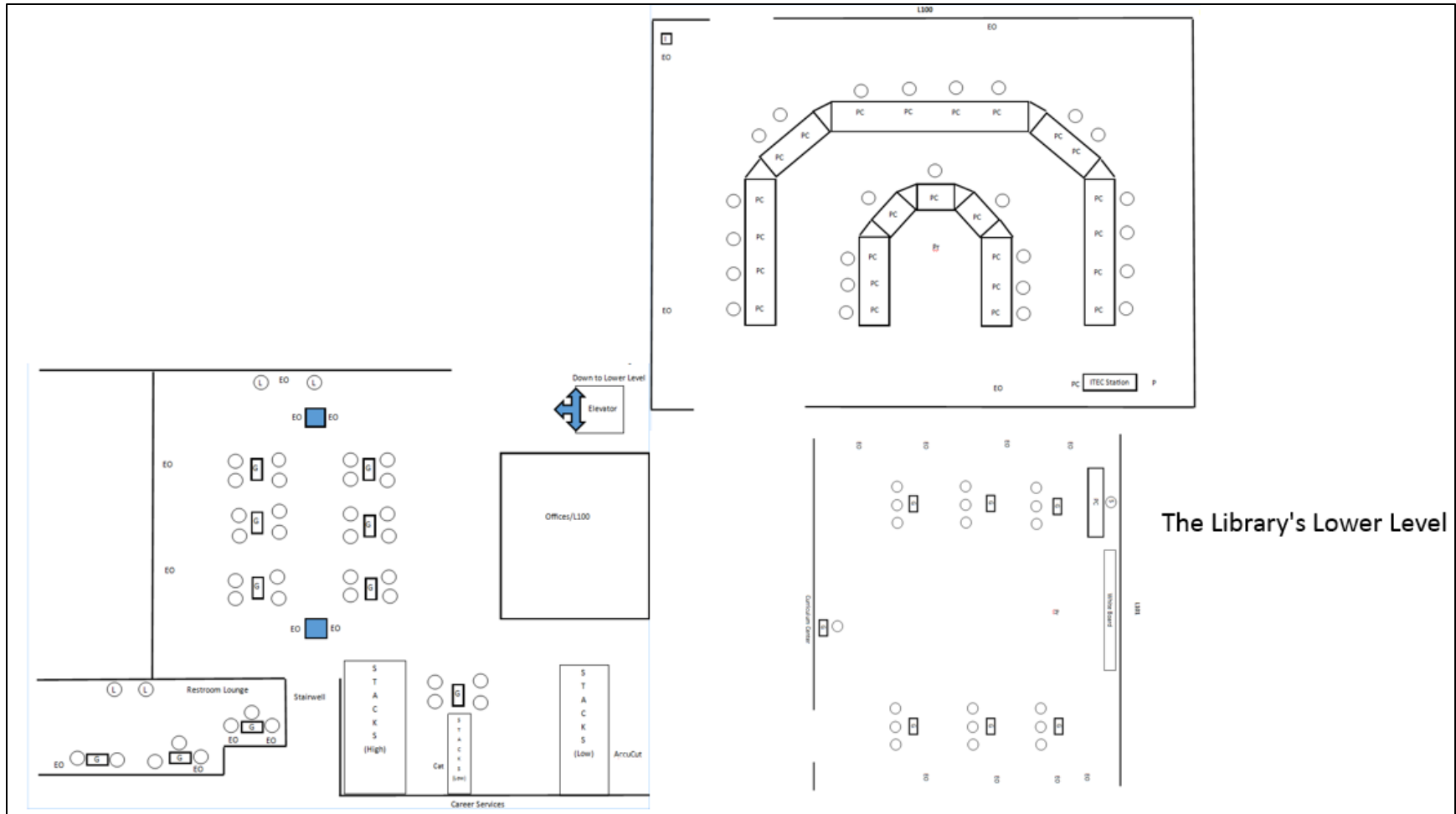
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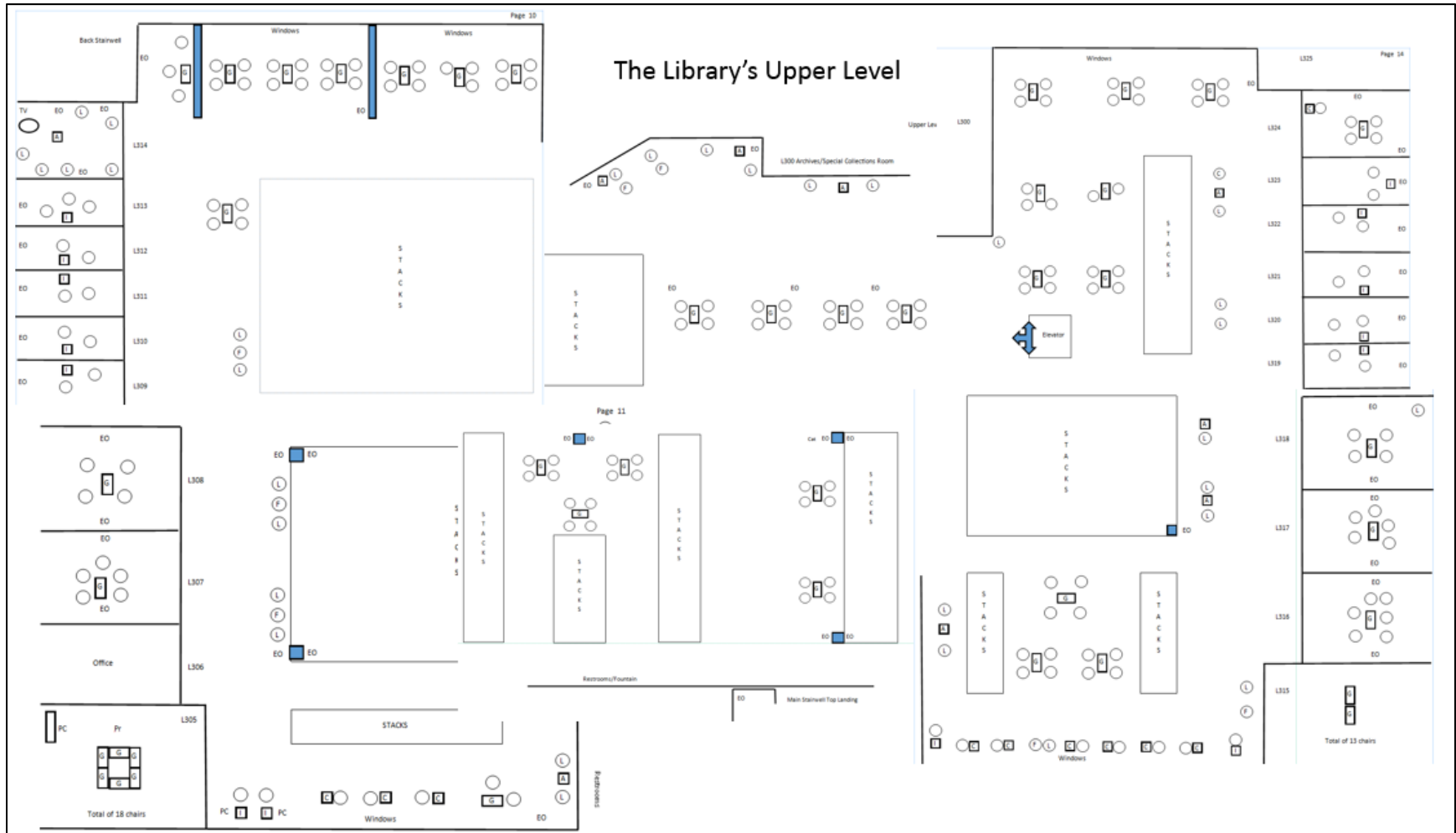
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Appendix A Library Maps







Appendix B

Library Space Assessment Survey

Q1 When I go to the library, I...

<input type="checkbox"/>	<input type="checkbox"/> Very Often (1)	<input type="checkbox"/> Sometimes (2)	<input type="checkbox"/> Never (3)
<input type="checkbox"/> Study (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Use the computers (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Print/ make copies (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Do group work (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Do important projects (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Write papers (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Receive/Offer tutoring (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Research (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Socialize (9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Check out a book (10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2 I go to the library...

<input type="checkbox"/>	<input type="checkbox"/> Very Often (1)	<input type="checkbox"/> Sometimes (2)	<input type="checkbox"/> Never (3)
<input type="checkbox"/> Monday-Thursday (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<input type="checkbox"/> Friday (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Saturday (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Sunday (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Morning (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Between classes (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Evening hours (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> During finals week (8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3 When I go to the library, I go to...

<input type="checkbox"/>	<input type="checkbox"/> Very Often (1)	<input type="checkbox"/> Sometimes (2)	<input type="checkbox"/> Never (3)
<input type="checkbox"/> Rooms on the quiet floor (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Quiet floor- open area (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Keating Room (tutoring) (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Main floor- open area (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Basement- computer lab (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="checkbox"/> Basement- tables (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (7)

Q4 When I go to the library I use...

 Very Often (1) Sometimes (2) Never (3)

Computers and rentable laptops (1)

Research help desk (2)

White boards (3)

Group tables with TV screens (4)

Smart bones (5)

Rentable games/movies (6)

Interlibrary loan (7)

Keurig (8)

Rentable chargers/headphones (9)

Q5 The library tends to be...

 Very Often (1) Sometimes (2) Never (3)

Too crowded (1)

- | | | | |
|--|-----------------------|-----------------------|-----------------------|
| <input type="checkbox"/> Too noisy (2) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="checkbox"/> Too hot (3) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| <input type="checkbox"/> Too cold (4) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Q6 I think the library needs... (check all that apply)

- Stress relief room with nap pods/ massage chairs/ stress relieving activities (1)
- Fans and air conditioning (2)
- More quiet rooms (soundproof) (3)
- Classrooms on main floor (4)
- Extended hours (5)
- More white boards (6)
- More tables (7)
- More computers on the main floor (8)
- More computers on the quiet floor (9)
- Outlets/tables with outlets (10)
- Grab 'n Go foods (11)
- Lounge chairs (12)
- Study chairs (13)
- Other (14) _____

Q7 Other places I study on campus include... (check all that apply)

- Salerno study labs (1)
- Dorm rooms (2)
- Student clubs & organizations office (3)
- Residence hall lounges (4)
- Pioch Cafe (5)
- Cyber Cafe (6)
- Classrooms (7)
- Nursing common area (8)
- ISHS lounge tables (9)
- COP (10)
- COP3 (11)
- Michaelhouse computer lab (12)
- Kearney computer lab (13)
- Mainstage (14)
- Outside (15)
- Other (16) _____

Q8 What updated features in the library are most important to you? Please rank order of least important to most important ; 1 equals most important.

- _____ Updated lighting (1)
- _____ Updated carpeting (2)

- _____ More windows (3)
- _____ Updated wall colors (4)
- _____ More nature (e.g., plants) (5)