

Where Students Want to Spend the Night: A Two-Phase Examination of Overnight Study Spaces

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Abstract

Over the past three years, overnight study hours have shifted between two different library branches and a new student-run facility that was intended to be a learning commons that would be managed by the student body of a southeastern US academic research library. This paper presents a completed two-phase study examining the preferences, needs, and uses by students of two on-campus, overnight study spaces. Multiple university researchers used online student surveys, unobtrusive observations, and sentiment analysis of over 2,000 open text survey comments to provide comprehensive data for administrative decision-making. Each facility has unique elements and services but only one could be funded to remain open overnight. The findings indicated that the most practical solution remained the traditional library setting for its greater number of seats and abundance of existing library features (public computers, group rooms, quiet spaces) that students expect in a study space.

Introduction

Academic libraries are increasingly transitioning their spaces from shelves with physical books to wide open spaces deemed “learning commons” in which users expect to find all types of technology, furniture, and other resources that support their expectations of study spaces.¹ This presentation summarizes the efforts undertaken in two examinations of students’ overnight study space use at a large southeastern US public university, including the more than 5,500 codes associated with the open text comments submitted in the Phase One online survey and the Phase Two analysis of the occupancy and feature-use in each facility during the overnight hours. The findings suggest that students have passionate and concrete ideas of what should be provided in an overnight study space and that study space design requires a nuanced approach to provide the appropriate number of seats and types of features that users always want available, even overnight.

Background

The university’s libraries have operated overnight study hours since fall 2014. In fall 2015, the hours moved from the humanities and social science (HSS) branch to the newly renovated science library, precipitating an often-passionate discussion between students, university administration, and library leadership, focusing on the question of which location offered the most comprehensive services and resources to meet student needs. Since student government (SG) has been the source of overnight library hours funding, the student voice has always weighed heavily in the decision-making. In response, a survey was conducted in spring 2016 to provide more evidence with which to justify the decision about where to locate the overnight study hours.² Based on the results, the overnight study hours were moved back to the HSS branch. All of this occurred with the understanding that, in spring 2017, SG would reopen an historic campus building, renovated to provide a modern study space for students. Almost immediately, there was resistance to overnight study hours not being made available at a **library**. Complaints from students cited insufficient seating and lack of quiet study spaces, among other concerns. But since SG was the source of funding for these hours, the assumption was that this body should make this decision, so they chose to host the hours at the new study hall but appealed to the university provost to support keeping the HSS branch open overnight for the fall 2017 semester. It was agreed that, during this time, the assessment office of student affairs and the libraries’ assessment librarian would conduct a study of the SG study hall and the HSS branch to determine which location would best suit students’ needs. The scope of this study did not provide convincing data, so the study period was extended into the spring 2018 term.

To understand the students’ needs, uses, and preferences of study space used overnight, as well as the capacity of each building to meet these concerns, a two-phase study was conducted in the fall 2017 and

spring 2018 semesters: the first was about the perceptions, preferences, and needs of students, and the second was an occupancy study of the hours between 12:00 a.m. and 8:00 a.m. In fall 2017, an online student survey was conducted; in spring 2018, we collected headcounts at each location for six weeks, eight times per night between 12:00 a.m. and 8:00 a.m., examining the use of specific spaces and calculating the productivity and capacity utilization of each location.

The HSS branch is spacious and has 1,600 seats, almost 300 public access computers, with group and quiet study space on each of its five floors, but has limited nearby parking and is located far from student housing. The new student-run study hall is a modern, brightly lit open space with 365 seats, no public computers but is close to student housing and transportation. This space was intended to host the overnight hours, replacing the four-year service held in the libraries. This paper presents the two-phase study that spanned two semesters, fall 2017 through spring 2018.

Literature

Schwieder and Spears conducted action research using both online and print surveys of academic library users in two campus libraries that had both run overnight library services to determine which branch users preferred and the features users valued at each.³ Given the limited funding available for overnight study spaces, only one branch could be funded to operate on a 24-hour, five day per week (24/5) basis. Switching the overnight location in the prior year generated a great deal of mixed feedback. So instead of providing anecdotal evidence for the siting decision, the library's assessment librarian conducted a survey, creating an extensive survey distribution process designed to gather feedback from both users and non-users of the libraries. In response to the siting choice selected by students, library leaders moved the overnight study hours back to the older, more traditional humanities/social science library. At the time of the switch, the services were extended to 24 hours, seven days per week (24/7).

In another study, Curry surveyed library users to determine feasibility of opening past 10:00 p.m. during spring/summer terms.⁴ Curry first identified that many studies are based on preliminary or anecdotal information that is either user-focused (preferences, usage) or management-focused (security, service levels, staffing, funding). Curry's survey used several of these criteria as decision-making indicators about whether extending a library's hours would return greater value given the library's limited available funding. The data indicated that increasing hours for a greater number of students for the entire year provided more consistent service and aligned the service with the library's designated discipline (education), rather than attempting to meet the needs of a secondary stakeholder group at the expense of the primary stakeholder group.

In another study of overnight hours prompted by funding concerns—an issue for every library—researchers developed a metric based on gate counts and occupancy that identified that each overnight service hour cost 20 cents per patron per hour for use overnight.⁵ The study found that extended hours cost the library 20 cents per hour per overnight user; ultimately, the library administration was compelled to measure costs versus gains (benefits to the student body) and did not extend the library hours into overnight hours but increased the number of days the library was open during the day.⁶

One library director used gate count increases, circulation increases, ILL increases, course reserve increases and anecdotal observations to decide to increase library hours.⁷ This decision also aligned with the library's new vision of expanding services and creating new features for students and faculty. The library saw an increase of 30% over the same period in the previous year. Rather than switching off 24-hour service during lower service periods, the library administration opted for consistency of service provision and retained the hours year-round. Lawrence and Weber conducted a multimethod study to examine the frequency and reasons for their use of the library during late-night hours (midnight to 2:00 a.m.), finding that users were interested in the quiet nature of the library atmosphere, computing, printing, group study, and resources during later hours and valued the library for its late-night access.⁸

Overall, researchers commonly use multiple institutional data points to inform different study aspects such as overall traffic, anecdotal observations, service use (printing, computing, Wi-Fi), and use of collections,

often integrating one or more methods of data collection such as surveys, interviews, observation, mapping, and statistics.⁹

Limited studies have looked at the impact of late-night library hours on student achievement. Multiple studies rely on self-reporting from surveys, such as one study that examined both how students used the overnight hours and users' perceptions of academic impact, finding that 90% of users thought overnight hours contributed to their academic success.¹⁰ Some impact studies used multimethod approaches but only three so far have attempted to examine relationships between student use of overnight study spaces and academic success: in two, they gathered self-reported success measures (GPA ranges);¹¹ in the third, they gathered student identifiers and used these to associate success as tracked by campus institutional research offices.¹² In the case of studies that include occupancy, counts are reported in aggregate and not segmented by type of usage.

In summary, a selection of the relevant literature suggests that most studies have focused on staffing, security, and services but need data on what users use during overnight hours; relatively few have looked at the impact on student success in general. Studies were initiated to assess either the overall use of the overnight services, focused on hours ranging primarily between 9:00 p.m. and 2:00 a.m., and used a wide variety of data to infer student needs, preferences, and usage. Sowell and Nutefall look at overnight use and impact but only from a self-reported viewpoint. Surveys are the primary mode of collecting data, with institutional data (gate counts, circulation, computing use) usually included to provide a broad view of users' diverse needs. In similar fashion, this study examines the actual use in the spaces, compares the use to both locations' available capacity,¹³ and compares these findings with the self-reported preferences by users.

Methods

The original proposal for this study was to analyze fall 2017 hourly traffic and occupancy of both spaces and to collect occupancy data using the traffic tracking systems of each building to better understand who is using the spaces. However, neither traffic systems proved to be reliable enough; in the absence of reliable occupancy data, we extended the study to a second phase to combine actual observed use of the spaces, conducting hourly occupancy counts segmented by seating and space type (individual, group, quiet, public computer station, etc). The phases are described as the distinct data collections that they were, but the analysis will combine the aspects of each that figured into the evidence to answer these three questions:

1. What are students' preferred features for an overnight study space?
2. What are the traffic and occupancy levels of the HSS branch library and the SG Study Hall during overnight hours from 12:00 a.m. to 8:00 a.m.?
3. What features and services are visitors using when they are in the HSS branch library and the SG Study Hall during overnight hours from 12:00 a.m. to 8:00 a.m.?

Phase One included analysis of use data, collected from both traffic and occupancy using the people counting sensors at both locations, and a survey distributed to all students during the fall 2017 term. The intent was to describe the study space usage and preferred features from the students' perspectives as well as to understand who was using the spaces and how frequently they visited. The survey focused on the usage of each space overnight; the frequency of resource use; the difficulty in finding available space overnight; and, the user's preference of where to study overnight. Demographic data collected included class standing and current major.

The survey was distributed by the SG to the entire student population of 52,669—including over 17,000 graduate students and almost 3,000 distance learning students. Multiple channels were also used to promote the survey in print and social media. For example, the HSS branch library and the SG study hall placed posters around the entrance encouraging visitors to complete the survey, with high profile university leaders (e.g., university president's Twitter account) supporting the survey. The survey gathered demographics,

usage frequency, and preferred features; the key question asked of respondents was to indicate the space preferred for overnight study use (from 12:00 a.m. to 8:00 a.m.). The survey received 5,585 complete responses, providing an 11.3% response rate.

Phase Two gathered data on traffic and occupancy for both locations using the people counter sensors for traffic and unobtrusive, in-person counts every night from 12:00 a.m. to 8:00 a.m. for six weeks. The unobtrusive observations were collected hourly, counting the number of users on all floors in each building, categorized as follows:

- Individual seating with public access computers
- Individual seating without public access computers
- Tables/countertops with multiple seating with public access computers
- Tables/countertops with multiple seating without public access computers
- Group study rooms
- Monitors in use—individual
- Printers
- Whiteboards

Categories below were collected to determine features and services utilization, but these counts were excluded from the occupancy count:

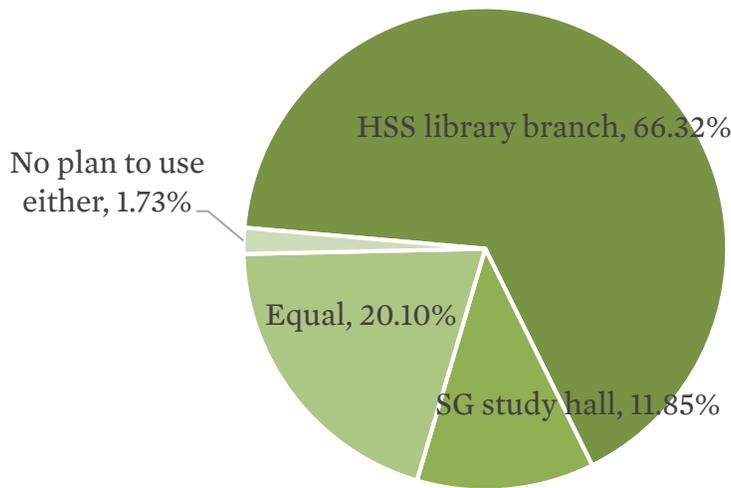
- Monitors being used in group study rooms
- Group (3+ people) study clusters—talking
- Group (3+ people) study clusters—quiet
- Individuals (= 2 persons) talking
- Individuals (1 or 2 persons) quiet

The second phase of the study was designed to collect hourly headcounts (occupancy) conducted between 12:00 a.m. and 8:00 a.m.; types of furniture and spaces being used (features); and, the types of activity taking place (quiet/talking behavior).

Findings

In Phase One, we collected 5,585 complete responses; undergraduates comprise more than 76% of survey respondents, while graduates are almost equally represented by masters and doctoral students. All 16 colleges are represented in the survey with just four (Liberal Arts & Sciences, Engineering, Business Administration, and Agricultural & Life Sciences) making up 63.3% of respondents. Over 66% of respondents indicated a preference for the HSS branch library, over 20% would use either space, and almost 12% indicated a preference for the SG study hall.

Figure 1. Preferred location for overnight study space (n=4,841)

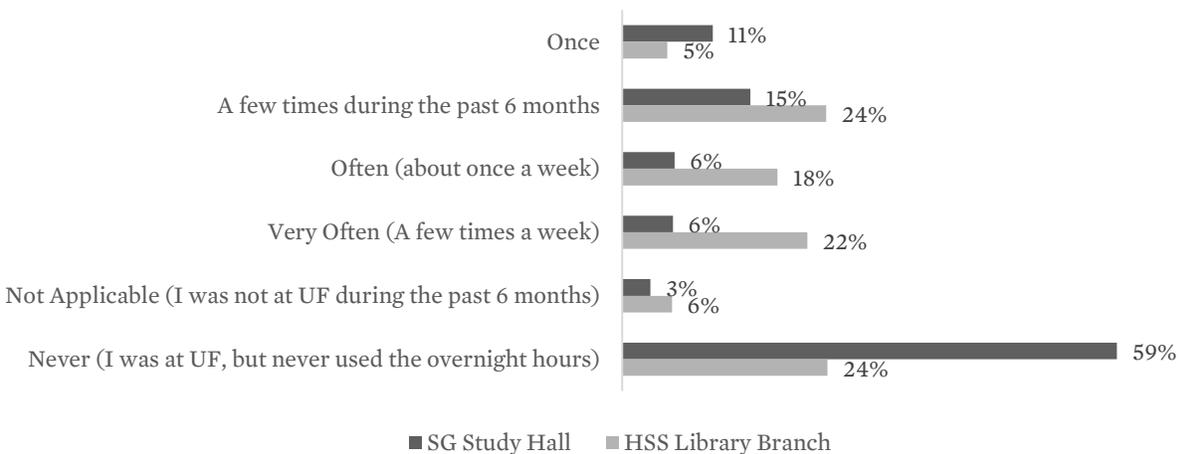


Usage of HSS Branch Library/SG Study Hall

Respondents were asked to report their usage frequency of each space; those who answered that they “never” used either space were asked to provide comments. Specifically, participants were asked, “In the past 6 months, how often did you use the HSS Branch Library [SG Study Hall] during overnight hours (between 1:00 am and 8:00 am)?”

Figure 2 illustrates the usage at each location by frequency, from “Once” to “Never.” 5,585 respondents answered this question about each space.

Figure 2. Frequency of use for each overnight study space.



Non-use of overnight study spaces

Findings are presented from the multiple-choice survey questions and the 5,452 open-ended responses describing the respondents’ choice of “Other.” There were 6,202 codes generated that encompass three topics: reasons for non-usage, descriptions of barriers to use, and additional comments. Some comments have multiple codes, e.g., a comment might present a positive comment about a location and then mention seating, food, resources, etc. The topics shift by question type, depending on the space being considered. The final question was an open-ended prompt for additional comments.

If respondents indicated they did not use an overnight space, they were asked the following question that solicited qualitative responses: “You indicated that in the last 6 months, you did not use the HSS [the SG study hall] during overnight hours (between 1:00 a.m. and 8:00 a.m.). Why not?”

We coded both explicit statements participants made about each space as well as implicit comments indicating reasons why they did not use a space. The 423 respondents who “never used HSS library branch” indicated that they did not use the HSS library branch because they prefer other locations: the Science library branch (178); an alternative space (119); just do not prefer the HSS library branch (77); or, the SG study hall (32). The 1,725 respondents who “never used the SG study hall” indicated that they did not use the SG study hall because they prefer other locations: the HSS library branch (506); they do not prefer the SG study hall (220); the Science library branch (145); an alternative space (41); or they live off campus (23). The reasons for not using each space were coded for implicit and explicit meaning.

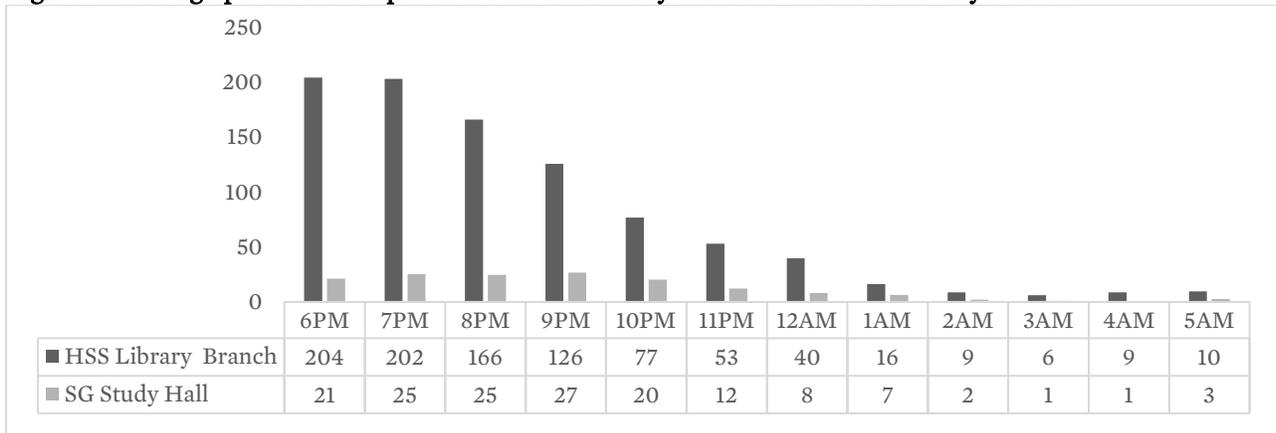
Table 1. Implicit/Explicit Reasons for not using a study space (most frequent codes)

SG Study Hall (n=1,714 comments, 1,734 implicit codes)		HSS Library Branch (432 comments, 225 implicit codes)	
Insufficient Seating	418	Other (No collaborative space, outlets)	39
Space not Conducive for Studying	399	Proximity to Residence	34
Too Noisy	183	Insufficient Seating	28
Insufficient Table/Desk Space	122	Safety to/from building	25
Other (Privacy, Lighting, Transport.)	97	Insufficient Parking	25
Prefer Library Setting	83	Location (on campus or other)	20
Uncomfortable study space	64	Insufficient Nighttime Transport	14
Insufficient Parking	48	Uncomfortable Study Space	11
No Public Access Computers	48	Inconvenience of Looking for Space to Sit	8
Location on Campus	32	Lack of Fri/Sat Evening Hours	7
Inconvenience of Looking for Space to Sit	31	Insufficient Resources (computers, printers, etc.)	5
Too Social to Study In	27	Too Noisy	5
Far from Residence	22	Awareness of Availability	4
Insufficient Outlets	20		
Awareness of Availability	20		
Stairs Waste Space	19		
Not Open on Game Day	18		

Answers such as insufficient seating or outlets indicate that respondents were not restricting their responses to the overnight experience, at least in the HSS library branch. While these responses provide formative value for management of the spaces, they do not reflect an accurate “overnight” experience. Therefore, an examination of the traffic for each space provides additional context for the use of each space during overnight hours.

For a complete examination of the use of the two spaces for overnight study during the fall 2017 term, Figure 3 illustrates the weekly average per hour of entries into both the SG study hall and the HSS library branch between the hours of 6:00 p.m. and 5:00 a.m. The weekly average traffic per hour should be viewed in contrast to the total seating capacity of 1,600 at the HSS library branch and a capacity of 365 at the SG study hall.

Figure 3. Average per hour comparison of the SG Study Hall and the HSS Library Branch.



Because the responses in the Phase One survey were not reliably based on the respondents' views of the study spaces as used during the overnight hours, Phase Two was designed to actually observe the number of users in the spaces and analyze this use based on the type of space or feature being used.

Phase Two Key Findings

The body of the report includes visual and narrative description of overnight occupancy and traffic for both the SG study hall and the HSS library branch, as well as the different types of seating and spaces in use and the type of activity (quiet/talking) in which overnight users were engaged. The Phase Two study represents six weeks of data collection that occurred each night at both the SG study hall and the HSS, from 12:00 a.m. to 8:00 a.m. The study team counted occupants at each facility once per hour, alternating the order of visiting each building with the median per hour displayed (Figure 4).

Figure 4. Median occupancy per hour for each overnight study space.

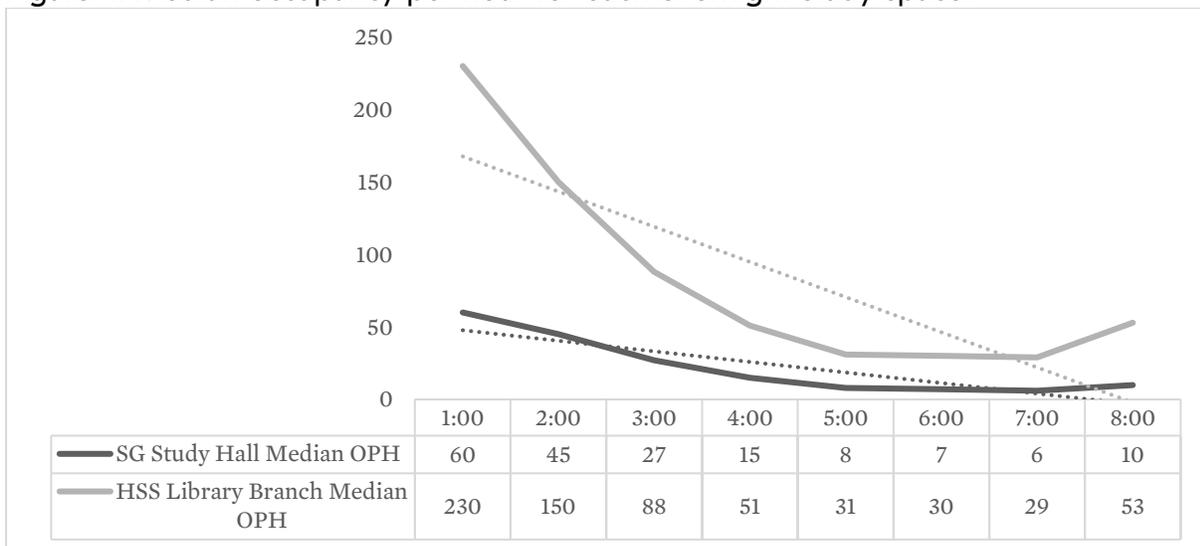
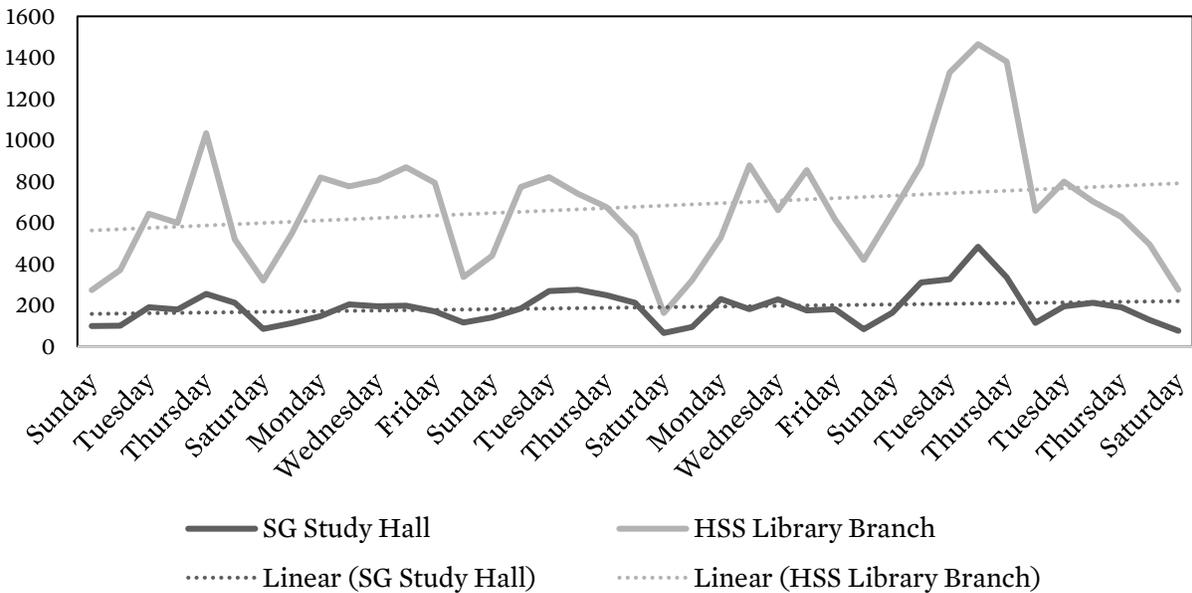


Figure 5 displays the total occupancy of the facilities for each night of the six-week period. These occupancy totals range from a low for the HSS library branch of 162 occupants (Saturday, February 17) to a high of 1,465 occupants on the Wednesday before spring break (February 28); for the SG study hall, the low occupancy was 65 occupants (February 17) and the high was 483 occupants on Wednesday, February 28. While the total occupancy for each night represents duplicate counts (one individual being counted each hour they use the

facility), it provides an accurate representation of the total occupancy and uses of the facilities between the hours of 12:00 a.m. and 8:00 a.m.

Figure 5. Total daily occupancy for each overnight study space, January–March 2018.



Capacity Utilization Based on Occupancy Totals

If we assume that all users would use one building if both buildings were not open during the overnight hours, the data shows that the SG study hall alone is insufficient to meet the current demand for overnight study space.

Table 2 is a sample of the hourly chart with which we tracked occupancy by hour and capacity utilization for both the SG study hall and the HSS branch library. **Total capacity** is 1,965, the combined maximum seating capacity of both facilities (365 for the SG study hall and 1,600 for the HSS branch library). **Total occupancy** for each hour is determined by adding the occupancy in both buildings. With this data, we can illustrate the effect of the **total occupancy** by hour for each facility and present the percent of capacity utilized. For instance, in the table below, on Tuesday, February 27, the sum of occupants in both buildings from 12:00 a.m. to 1:00 a.m. equals 504 occupants. Dividing that number by the total seating capacity of the SG study hall shows that seating demand (504) exceeds capacity (365 seats) by 38.1%; for the HSS branch library, the seating demand (504) would utilize just 31.5% of its capacity (1,600 seats).

During the six-week study period, there were a total of 30 hours in which the **total occupancy** exceeded 75% of the capacity of the SG study hall. Of these, there were nine hours in which the combined occupancy of both buildings exceeded 100% of the capacity of the SG study hall. Most of these hours occurred from 12:00 a.m. to 1:00 a.m. (n=21). It is important to note that Marston Science Library was still open during this time (closing at 1:00 a.m. on all of these evenings).

Table 2. Sample Capacity Utilization by Facility

Date/Time	SG Study Hall (365)	HSS Lib 1600)	Total Occupancy	SG Study Hall Capacity	HSS Lib Capacity
Tuesday 2/27/2018					

Date/Time	SG Study Hall (365)	HSS Lib 1600)	Total Occupancy	SG Study Hall Capacity	HSS Lib Capacity
12-1	100	404	504	138.1%	31.5%
1-2	68	344	412	112.9%	25.8%
2-3	55	200	255	69.9%	15.9%
3-4	35	119	154	42.2%	9.6%
4-5	20	78	98	26.8%	6.1%
5-6	19	49	68	18.6%	4.3%
6-7	9	46	55	15.1%	3.4%
7-8	20	88	108	29.6%	6.8%
Total	326	1328	1654		
Wednesday 2/28/2018					
12-1	125	450	575	157.5%	35.9%
1-2	120	344	464	127.1%	29.0%
2-3	90	201	291	79.7%	18.2%
3-4	53	113	166	45.5%	10.4%
4-5	31	86	117	32.1%	7.3%
5-6	25	72	97	26.6%	6.1%
6-7	21	84	105	28.8%	6.6%
7-8	18	115	133	36.4%	8.3%
Total	483	1465	1948		
Thursday 3/1/2018					
12-1	85	406	491	134.5%	30.7%
1-2	75	309	384	105.2%	24.0%
2-3	51	232	283	77.5%	17.7%
3-4	45	135	180	49.3%	11.3%
4-5	23	83	106	29.0%	6.6%
5-6	19	68	87	23.8%	5.4%

Date/Time	SG Study Hall (365)	HSS Lib 1600)	Total Occupancy	SG Study Hall Capacity	HSS Lib Capacity
6-7	16	63	79	21.6%	4.9%
7-8	20	84	104	28.5%	6.5%
Total	334	1380	1714		

Feature Utilization

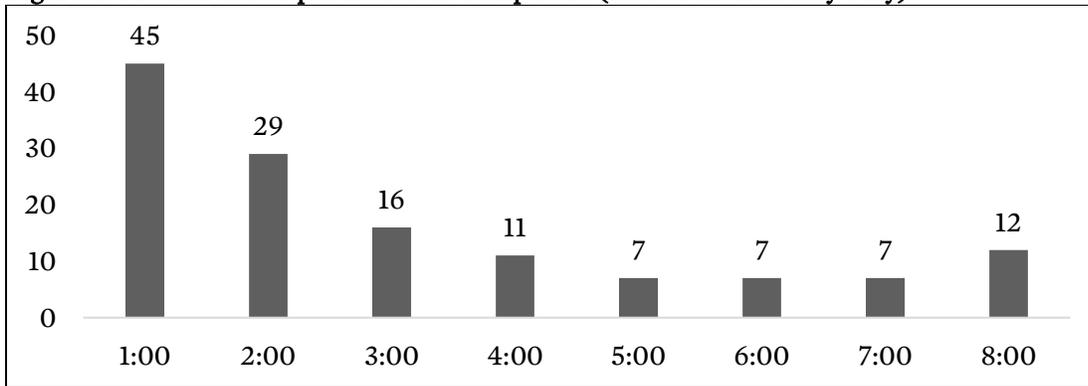
The study included counts of features in use (e.g., tables, carrels, couches). Table 3 illustrates the features being used at the SG study hall and the HSS branch library. The strongest feature for both facilities is ‘seating for multiple users’; ‘individual seating’ is the second most frequently used feature. However, the HSS branch library can provide ‘individual seating’ both **with and without** public access computers. As illustrated below, use of seating with public access computers occurs at the HSS branch library throughout the entire overnight period. The data also show that group study rooms in the HSS branch library average up to twenty users per hour until 3 a.m.

Table 3. Features Used at Each Study Space

Feature	SG Study Hall (N)	SG Study Hall (%)	HSS Branch Library (N)	HSS Branch Library (%)
Tables/countertops with multiple seating without public access computers	4336	63.8%	11256	43.4%
Tables/countertops with multiple seating with public access computers	n/a	n/a	243	0.9%
Individual seating with public access computers	n/a	n/a	5574	21.5%
Individual seating without public access computers	2121	31.2%	5192	20.0%
Group study rooms	256	3.8%	2986	11.5%
Dining	80	1.2%	521	2.0%
Couches	255	3.8%	n/a	n/a
Other (restrooms, printer)	155	2.3%	168	0.6%
Total Six-Week Occupancy	6793	100.0%	25940	100.0%

The use of public access computers averages above 10 computers per hour until 5:00 a.m. Figure 6 shows the median per hour use of public access computers at the HSS branch library throughout the overnight hours. Each facility has features not found in the other, notably public access computers and designated quiet space in the HSS branch library, and couches and stair seating in the SG study hall.

Figure 6. Median use of public access computers (HSS branch library only).



Use of Overnight Spaces for Quiet Study

Finally, the study team observed the occurrence of both quiet and talking behavior with each count of occupants (Table 4). Quiet activities occurred among pairs or groups of users until 4:00 a.m. There was no observed activity after 4:00 a.m. for either facility as, at that time, most users were singles. Although the lack of designated quiet space at the SG study hall had been noted by student comments during the fall 2017 survey, the data gathered during this study do not support a lack of quiet space during the overnight hours.

Table 4 illustrates the instances of quiet/talking uses. Both facilities demonstrate similar trends in use of most features, especially of quiet space activities.

Table 4.

Type of Use	SG Study Hall	HSS Branch Library
Quiet pairs	295	1,133
Talking pairs	170	756
Talking groups	168	643
Quiet groups	76	391
Monitors in Use in Group Study Rooms	20	87

Discussion

Analysis of the survey findings indicates that when students were offered a choice between the HSS library and the modern study hall for overnight study hours, the traditional library setting was preferred by 6 to 1. Also, in analysis of the open text comments, almost 15% of respondent comments indicated a preference for a third space (the nearby science library).

Students commented about space use in general, not just their overnight use, so the survey had marginal value in answering questions about usage during those hours. This phenomenon precipitated the spring 2018 study, as the student government and the provost did not want to rely on self-reported data in the absence of occupancy data that would conclusively indicate what students actually use.

In the survey comments, students indicated that certain elements make a facility a “library,” and these were not present in the study hall, thereby diminishing its value and eliminating features students want, even overnight. These elements included adequate tables, chairs suitable for long periods of writing and reading, adequate quiet space, sufficient and comfortable seating, and public access computers. Students

overwhelmingly indicated reasons for not using the SG study hall for overnight, with over 1,700 comments made in response to a query about non-use of a space specifically designated for and managed by the SG. Almost one-third of the comments (399) stated that the “space is not conducive for studying.”

Based on the qualitative nature of the survey and the inaccurate response pattern of the participants (i.e., referencing experience that was not restricted to overnight hours), the assessment librarian and key HSS branch library staff designed the occupancy count-by-feature, thereby gathering counts of users per overnight hour and collecting data on the physical use of the spaces, quantifying features students used overnight such as public access computers and group study. Key findings include the analysis of the traffic and occupancy levels, which, when combined to understand the total number of students using an overnight study space, exceed the capacity of the SG study hall on several weeknights for several hours until about 3:00 a.m. If funding is only available for one study space, then the space has to accommodate all of the students studying on campus overnight.

It is also clear that the SG study hall is missing features available at the HSS branch library during the overnight hours that students are clearly using. It is notable that an average of almost 30 students are using public access computers at 2:00 a.m. Even if the SG study hall added public access computers, it would still need some space redesign to provide enough quiet study space and some more traditional study furniture to provide for those students who need this type of furniture.

While student responses from the online survey indicated not only a preference for the traditional library for overnight study, they were equally vocal about the shortcomings of a space design intended to facilitate the collaborative needs of student study. However, key fundamental elements appeared to be missing (e.g., public access computers, quiet study space) and the study hall simply does not have enough seating to accommodate the number of students using overnight spaces after all the other study spaces close for the evening. This study suggests that, while collaborative spaces are suggested to be in demand by students, there is more demand to meet the study needs of students that libraries inherently provide.

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Endnotes

1. Mosley et al., “Making It Fit,” 91–103.
2. Schwieder and Spears, “Studying the Night Shift,” 2–19.
3. Schwieder and Spears, “Studying the Night Shift.”
4. Curry, “Opening hours,” 375–385.
5. Heim, “Open twenty-four hours.”
6. Heim, “Open twenty-four hours.”
7. Sewell. “24-hour access,” 14–27.
8. Lawrence and Weber, “Midnight–2.00 am,” 528–548.
9. Curry, “Opening Hours”; Lawrence and Weber, “Midnight–2.00 a.m.”; Sewell, “24-hour access”; Bowman, “24-hour academic libraries,” 217–239; Sanders and Hodges, “An overnight success?” 309–320.
10. Sowell and Nutefall, “Mysteries in the night,” 96–114.
11. Saka, “Extended hours,” 27; Sowell and Nutefall, “Mysteries in the Night.”
12. Scarletto et al. “Wide awake at 4 AM,” 371–377.
13. Sowell and Nutefall, “Mysteries in the Night.”

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