
In an era where students rely on the academic library much more often for study space and services than for locating books, libraries have had to increase focus on what students need to successfully study. With a rise in collaborative assignments, one thing students need is collaborative group study space, but it is often difficult for library staff to discern what exactly students need from these necessarily private areas. This study sent surveys to group study room users at The University Libraries at The University of North Carolina at Chapel Hill and observed group study room sessions to learn how students use the resources in these spaces. Findings indicate that convenience is an important factor for resource use, remote collaboration and interviews occur in the spaces, and Google Documents are important parts of the student collaboration process. Use based on factors such as department affiliation is also discussed.

Headings:

Academic libraries -- Space utilization

Academic libraries -- Group work rooms

Study environment
“WHAT’S GOING ON IN THERE?”: HOW USERS ARE USING RESOURCES FOR COLLABORATION IN RESERVABLE GROUP STUDY ROOMS IN THE UNIVERSITY LIBRARIES AT THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

by
Margaret Elizabeth Edwards

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Approved by

Rebecca Vargha
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Introduction

1.1 Background

Modern academic library users expect libraries to meet many more needs than access to books and journals necessary for research. Students expect university libraries to provide space, technology, and services to fit a variety of needs (Borgman, 2000). They need an area to use the myriad of personal devices they bring to campus in order to complete their coursework (Manuel, 2002; Merritt, 2002; Straumsheim). Some students still need quiet space to study for a test, find articles for their research, write a paper, read for class, or complete other types of individual work, and academic libraries are still providing space to meet quiet study needs. However, many areas of the library are no longer silent. Now, spaces are being set aside where students can meet with one another to work together on endeavors such as group presentations, joint coding assignments, and collaborative research assignments, among many other projects (Howe & Strauss, 2000; Hillman et al, 2017). This is reflective of an increasing trend among college professors to include collaborative assignments in their coursework in order to better prepare students to create deliverables alongside future colleagues in the workforce. Professors may also use group projects to offset the effects of rising class sizes by both requiring students to interact with one another and to lessen the burden of grading large numbers of assignments (Gameson, 1994; MacWhinnie, 2003; Steiner & Holley, 2009). Some students simply prefer to study in groups so that they can compare notes and explain topics to one another (Gardner & Eng, 2005; Howe & Strauss, 2000). While libraries are
beginning to set aside space to meet students’ needs for places to meet with groups, research still needs to be done to understand how students are actually using these spaces and the resources provided in them to collaborate.

### 1.2 Description of Reservable Group Study Rooms in the University Libraries at the University of North Carolina at Chapel Hill

To meet these needs for collaborative spaces, The University Libraries at the University of North Carolina at Chapel Hill provides reservable group study rooms at many of the library locations across campus. While other areas in the University Libraries may get used for collaborative learning, these areas are specifically reserved for this purpose. These rooms are designed to hold anywhere from four to fifteen people each, depending on the location. They also differ in resources provided - they have varying combinations of white boards, display screens, and projectors. All group study rooms in the Libraries provide access to power outlets to charge personal devices and Wi-Fi access. In total, there are sixty-three enclosed group study spaces in the campus libraries that the University Libraries users can reserve online at the Libraries’ website through a reservation and calendar service called LibCal, a product of the company Springshare. They can be booked online up to two weeks in advance for time blocks of up to six hours by UNC affiliates. Most study rooms remain open for anyone to use when they are not booked, although some rooms require users to swipe their campus identification cards in order to gain entry. These rooms are widely popular among students, as evidenced by the fact that they are often nearly fully booked, especially during peak times in the semester around midterms and final exams (The University Libraries). Despite the popularity of these rooms, little has been done to discover how people actually use the rooms once they
are in them and how they are using the resources provided in them (The University Libraries).

For the purpose of this study, the group study rooms have been broken down into five groups based on location. These groups include Davis Library Stacks, Davis Library Cubes, the Health Sciences Libraries, Kenan Science Library, and the House Undergraduate Library. Each group is described below.

1.2.1 Davis Library Stacks

In the Walter Royal Davis Library, the campus’s main library, there are thirty-six reservable group study rooms that are located around the perimeter of the book stacks on floors three through eight. Each room holds up to five students, and most are equipped with dry erase boards. Most require students to swipe their University identification cards to enter the rooms (The University Libraries).

*Image 1: A reservable group study room in the Davis Library stacks, with large writable surfaces on all four walls.*
1.2.2 Davis Library Cubes

On the second floor of Davis Library, there are seven reservable cubicles. Five cubicles hold four people and two hold eight people. The cubicle walls are five feet high, and they are equipped with sliding doors. All have dry erase boards, some of which are opaque and some of which are transparent to allow more light into the cubes (The University Libraries).

*Image 2: A reservable group study “cube” on the second floor of Davis Library, with opaque writable surface to the left and clear writable surface on the right.*
1.2.3 Health Sciences Library

Image 3: A reservable group study room in the Health Sciences Library, with a display on the left and a large writable surface on the right.

The Health Sciences Library is located near the medical buildings on campus and serves departments such as the School of Medicine, the School of Nursing, and the School of Public health, among other users. The Health Sciences Library has six reservable group study rooms, all of which are on the first floor. They each can seat five students and have both dry-erase boards and plasma display screens (The University Libraries).
1.2.4 Kenan Science Library

Image 4: A reservable group study room in the Kenan Science Library, with a writable surface and retractable projection screen.

The Kenan Science Library is located in the bottom of Venable Hall, a science building on UNC Chapel Hill’s campus. The library focuses on its makerspace and providing science students areas to study both independently and as groups. In the Kenan Science Library, one reservable group study room offers a projection screen and seats eight people. Three additional rooms seat four and provide dry-erase boards and a computer monitor (The University Libraries).
1.2.5 House Undergraduate Library

Finally, the House Undergraduate Library has a total of ten group study rooms, spread between the first and second floors. This library focuses primarily on providing resources and services to the campus’s undergraduate population. Five rooms seat between six and eight people and have wall mounted displays and large dry erase boards. Four more seat between six and ten people and have writable walls. Finally, one more room can seat fifteen people and has a large wall-mounted display (The University Libraries).
Literature Review

2.1 Changing Needs for Academic Library Spaces

Space use and prioritization in academic libraries has changed drastically in the last twenty years. Libraries are ever concerned with meeting the needs of their patrons, which in an academic library space primarily consist of students, faculty, and staff. In the 1990s, the proliferation of the Internet led many academic libraries to install computer labs, which provided patrons with access to information in ways that they had never had before. It was therefore still often necessary for patrons to enter the physical library space to access information from library resources, even while much of that information was switching from physical to digital (Borgman, 2000; Waters, 2001). However, as libraries transitioned into the 2000s, students increasingly had access to the Internet – and therefore information resources – outside of library spaces, and, more and more, students had access to their own laptops or personal computers. While some students might still prefer using library computers to avoid carrying around still-clunky laptops, the trend was clear; students were depending less and less on physically entering the library space in order to gather information (Bennett, 2003; Bailin, 2011; Kocevar-Weidinger et al., 2007; Straumsheim; Villanueva & Wong, 2007, Waters, 2001). Academic libraries were left with a question: Will students still need physical library space, and if so, what will that space look like?

This question led to the rise of several theories now important to the way that libraries think about the services they provide. Before these technological changes,
libraries did not need to put too much effort into justifying why they needed a physical presence on campuses. To do research, students, faculty, and staff would have to retrieve physical materials from the library. Physical materials, of course, require physical space, and while a researcher was there, they would probably need even more space to read those materials they retrieved. And it clearly made sense for that space to be central to campus activities, as most people on campus needed libraries’ physical resources (Kocevar-Weidinger et al., 2007). However, dissociating the necessity of gathering information with the act of walking into the library changed that (Borgman, 2000). The concept of “library as place” came into conversation in order to deal with the issue of how libraries can use their space to better serve patrons in a modern era of information retrieval, and what users need to make libraries a destination. Space use had to some degree always been user-centric, but now the user’s needs were much less obvious, and library as place came in to address those (Freeman, 2005; Montgomery and Miller, 2011; Mathews, 2016). The idea of thinking of a library as a “third-space” - an idea also applied to areas like coffee shops and restaurants – seeks to address why people seek out spaces outside of work and home (Bailin, 2011; Kocevar-Weidinger et al., 2007; Oldenburg, 1989).

2.2 Assignment of Group Work

At the same time, another trend was occurring. Professors were beginning to catch on to a teaching innovation: collaborative projects. Group assignments allow students to practice interpersonal skills that are applicable in real-world working situations, where projects are rarely tackled by one person alone, and employees must negotiate with each other to complete work. Group work also helped to mitigate some of the issues caused by
soaring higher-education class sizes; working with small groups outside of class allows students to form connections in an otherwise overwhelmingly large class (Gameson, 1994). With this rise in collaborative learning, some academic libraries were beginning to see that groups wanted to work together in the library, and that, unfortunately, these groups were in some cases disturbing those who still needed the library to provide a quiet space for individual study (Asher et al., 2017; Khoo et al., 2016; Kim Wu & Lanclos, 2011; Massis, 2012; Villanueva & Wong, 2007; Walton, 2006). Many students also wanted a place to study socially, even if they were working on completely different projects. Modern students often want space to be able to work both collaboratively and simply alongside one another while talking and eating with friends and classmates without fear of disturbing others (Bennet, 2003; Howe & Strauss, 2000). Realizing that they may be able to downsize the amount of space devoted to desktop computers, libraries began to use this new-found floorspace to provide group study rooms (Bennet, 2003; Kim Wu & Lanclos, 2011; Villanueva & Wong, 2007).

### 2.3 Student Needs in Academic Group Work Spaces

#### 2.3.1 Availability

Most research into group study rooms in academic libraries has come in the form of case studies of individual libraries. Research is usually conducted for the purpose of evaluating existing group study rooms or gathering information to prepare for renovations to or construction of group study rooms within that academic library. A common finding is that students want more study rooms to be made available, and that they want more flexibility in the types of groups that can reserve the rooms. For example, the University of Wisconsin-Whitewater conducted two surveys, in 2006 and 2007, and
found that students wanted more rooms to be available and for smaller groups of students to be allowed to reserve the rooms. Their usage statistics support this need (Villanueva & Wong, 2007). At the University of New South Wales, interviews also suggested that students wanted more group room availability (Bailin, 2011). Focus groups at Concordia University Library found that students want more group study rooms (Hall and Kapa, 2015). Penn State University even found that students could benefit from private rooms that are reserved for religious practices, such as prayer (Mross and Riehman-Murphy, 2018). A general space-use observational study at Grand Valley State University found that users move white boards and furniture around to create “rooms-on-the-fly” when group rooms are not available, and that during peak times the library is crowded enough that study room usage must be limited to large groups (Gullikson, 2016). Texas A&M also has high demand for their group spaces, so much so that they piloted the use of restaurant-style pagers to manage wait times (González, 2012). However, it is important to know that these demands are not universal. A 2017 survey of users of the Kenneth Dike Library at the University of Ibadan in Nigeria found that students wanted more quiet study spaces and were ambivalent about group work areas (Adeyemi, 2017). At St. John Fisher College, researchers found that, while users want group work space, they also want spaces completely devoted to independent study, a finding also evident at UNC Charlotte (Hillman et. al, 2017; Kim Wu & Lanclos, 2011).

2.3.2 Soundproofing
Another common finding is that patrons have concerns about soundproofing. Students are often either concerned that they are disturbing others while using group study rooms, or, more often, are disturbed by others. Despite this common concern, few
libraries have added real soundproofing to their group study rooms (Primary Research Group, 2015). Researchers at the University of Wisconsin-Whitewater found this request from students (Villanueva & Wong, 2007). At Columbus State Community College Library, it was found that providing areas where silent study could be conducted is important, and therefore noise containment is critical (Massis, 2012). Group study room users at Loughborough University were concerned both about their noise distracting others and noise filtering into the room distracting the group (Walton, 2006). At St. John Fisher College, researchers found that students prefer to use spaces very clearly delimitated as either noisy space or silent space, and avoid spaces where that discrepancy is not clear (Hillman et. al, 2017).

2.3.3 Resources

Efforts have been made to include resources that promote collaboration in group study spaces. Studies are mixed about the use of resources provided to students in the group study rooms. Generally, when asked, students like and want more features like display screens. Students usually also want more access to power outlets (Primary Research Group, 2015). When the University of Wisconsin-Whitewater opened their “collaboratory” group rooms in 2006, they included interactive SMART boards, projectors, a computer workstation, and Wi-Fi access. Researchers at the university claim that students value the technology inside of study rooms (Villanueva & Wong, 2007). In fact, a 2015 study of forty-three colleges showed that most study rooms have at the very least whiteboards and internet access, and around 36 percent have display screens installed (Primary Research Group, 2015). However, the University of New South Wales found in interviews that only eleven percent of students use plasma screens in the group
study rooms, and even fewer use the DVD players provided. The researcher speculated that instructional signage might improve these numbers (Bailin, 2011). A study from NC State University suggests that technology might not be the biggest factor that students consider when selecting study rooms (Group Study Room Usage Patterns, 2011), and a study completed for a master’s paper showed that students at NC State often use their own personal devices, such as laptops, in group study rooms (Johns, 2012). The University of Central Missouri found in a survey that, while students appreciated whiteboards in group study rooms, they did not use webcams and microphones also included in the space (Ruleman and Kaiser, 2017). As mentioned above, Gullikson found that students at Grand Valley State University use rolling white boards to create impromptu study rooms (2016). In a study that utilized environmental scans across several libraries by Andrews and Wright, it was found that students used phones, laptops, and headphones most often, and that the most demanded item was whiteboards. The study also recognized that students frequently used Google Docs for collaboration (Andrews et al., 2016).
Methods

3.1 Research Question
The purpose of this study is to discover how students are using library space, specifically reservable group study rooms, to facilitate collaborative learning. How are students utilizing resources, such as display screens, projectors, and white boards, provided to them in reservable group study spaces in the University Libraries at UNC, to collaborate with one another, and how are they integrating their own personal technological devices with these resources? If they are not using these resources, are there clear reasons why they are not using them? This study will aim to learn what students need from the study rooms in order to help the University Libraries make decisions in the future about what students need and expect from these rooms.

3.2 Overview
This study utilizes a mixed-methods approach. Quantitative data was obtained in order to determine what resources group study room users use the most to collaborate (Maxim, 1999). Qualitative data was used to obtain a more holistic understanding of how users are using those resources to collaborate, or why they are not using them (Marshall & Rossman, 2011). Generally, quantitative data was aggregated and assessed for general trends and patterns and then compared against trends and patterns in the qualitative data. Qualitative data was hand-coded for common themes and trends by using a multiple pass process to refine the codes into general themes. Both qualitative and quantitative data were obtained from observational and survey data, but the observational data was
weighted towards qualitative data. The bulk of the quantitative data therefore came from
the surveys, but these surveys also contained qualitative data in the form of free-response
questions.

3.3 Survey Data

Because the quantity of observations was limited by the responsiveness of
students to being observed, the length of the observations, and the timeframe of the study,
observational data was augmented with a Qualtrics survey distributed via email to all of
those who reserve rooms during the research period before their session began that asked
them to describe the last experience they had in a group study room. These surveys do
not give a full picture of how a reservation session unfolds and only illuminate behaviors
that group study room users are aware of. However, they do provide a larger dataset of
qualitative and quantitative information that aid in developing an understanding of what
resources students are using in the group study rooms and how they are using them. In
addition, they allow for comparison of the researcher’s personal observations to the
thoughts of the user set.

Users who reserved the group study rooms in the study period from February 21st,
2019 to March 8th, 2019 were sent a link to the Qualtrics study. This time frame captures
a portion of the busy midterm season, when the group study rooms get a large volume of
usage. The survey first asked students questions about what they were working on the last
time they used a group study room, such as whether they were working on a group work
assignment or studying for a class, how many people were present for that room booking,
and which study room they booked. It also asked what resources in the room they
remember using and contained free-response areas to ask either what they used them for
or why they did not use them. The survey also asked what resources of their own they used, such as laptops or cell phones. Finally, the survey asked if they think items are missing from the rooms that could potentially help them with collaboration and provided an invitation to participate in observation sessions, described below.

This information was aggregated in an Excel spreadsheet. Qualitative information obtained through free response questions was hand-coded and assessed for patterns. Quantitative information was aggregated and assessed in conjunction with the qualitative information to look for patterns in usage. Finally, this information was compared to that obtained in the observational data.

### 3.4 Observational Data

This study obtained both observational and survey data. Observational data allowed the researcher to see how exactly students are using the resources in the study rooms, how and if these resources allow them to collaborate, how and if they integrate their own personal devices into the room, and how and if they have issues doing so. Being present and observing allowed the researcher to pick up on behaviors that study room users might not be aware that they are doing. In order to fully understand how students are using the space throughout the study room reservation period, the researcher was present in the room for entirety of the group study sessions. The researcher began the sessions by reading a script explaining the project and asking the users for consent, but otherwise the researcher did not modify the group study session in any way.

Participant groups were chosen via a convenience sample. The survey sent to group study room users before their reservation period ended by asking users to provide their email address if they were willing to have their session observed. The researcher
looked those provided emails addresses up in the LibCal system to see when their next study session was, and then attended those sessions if possible. The observations began in late February and continued through late March in order to capture data from users working on group projects and midterms. From those who consent to being observed, efforts were made to ensure that all study room locations were included, and that data was captured from users studying as many different topics as possible. The topic of study was obtained from the reservation form. During each observation session, the researcher filled out a form that asks what, generally, the students are working on, such as studying for a class or working on a group assignment, and how many people are present. The form also asked what resources are available in each room, if users used them, at what point in the session they started using them, at what point they stopped using them, and how they use them. Similar information was filled in about what resources of their own users are bringing in to the room. The observer also made notes about how and if the users use the two types of resources in conjunction with one another. The observer also noted any general observations about how and if the students are collaborating with one another and using resources.

The quantitative data from these observations, such as which resources get used and what types of work students are doing, was aggregated into an Excel spreadsheet and analyzed for general patterns. The qualitative data, such as how the resources are being used, was hand coded and explored for trends. Both types of information were examined in tandem to try to discern any additional trends. Finally, information from the observations were compared to information obtained from the Qualtrics surveys, described above.
3.5 Gap Filled

Unlike past studies on university group study rooms, which primarily focus on amount and type of use of the room or on things that users want added to the rooms (Adeyemi, 2017; Bailin, 2011; González, 2012; Group Study Room Usage Patterns, 2011; Gullikson, 2016; Hall and Kapa, 2015; Johns, 2012; Villanueva & Wong, 2007), this study focuses on how users are using the resources provided to them in these rooms. In addition, it examines what resources students are bringing into the rooms themselves. What little observational data that has been done in the past in this area has been brief observation of activity in study rooms or areas of the libraries in general. Researchers would walk by study rooms at regular intervals and relatively quickly assess from the outside what students are doing in those study rooms (Andrews et al., Gullikson, 2016; Johns, 2012). Research that takes an in-depth ethnographic approach to understanding student behavior has focused on the library as a whole rather than specifically group study rooms (Asher et al., 2017; Kim Wu & Lanclos, 2011). This study’s approach to observing a full reservation session gives insight into what actually goes on in the course of a reserved session in a study room. In addition, observational data has rarely been paired with surveys about study room resources, which potentially results in a larger understanding of how the user-base perceives and uses resources in the group study rooms.

3.6 Biases and Limitations

Because the researcher is both a library science student and a library employee, there are some biases at play here. Prior informal observations of group study room use made on the job could color the way that the researcher interpreted observations in the study. The structure of an observation form to guide the researcher’s notes is intended to
minimize that bias. Students could have also been influenced to be more likely to use resources or stay on task during the observation sessions because of the presence of the researcher in the room. The study is also limited in that the number of observations must be small compared to the number of uses the group study rooms get because of time constraints and the willingness of students to participate. It is also not possible to monitor changes in the use of the resources throughout the semester due to time constraints placed on the research project.

The survey responses also have limitations. Those who chose to participate in the survey are more likely to be those who have stronger opinions about the group study rooms, and therefore those who are apathetic about the rooms are less likely to be represented. In addition, the survey responses are limited by the participants’ memories, which will limit the level of accuracy and detail that can reasonably be obtained. Finally, because participants were selected using the list of room reservations, those who use the rooms without reserving them are not represented.
Results

4.1 Survey Results

The survey was emailed via Qualtrics to 2055 group study room users between February 24, 2019 and March 7, 2019 in eleven segments. In total, 199 responses were collected between February 24, 2019 and March 13, 2019. Three respondents indicated that they had never used a group study room before, and thirty-four users did not complete enough of the survey to produce usable data, leaving 162 total usable survey responses.

4.1.1 Quantitative Results

The survey results indicated that the majority of group study room users are undergraduates, with 111 responses from undergraduates, forty-four responses from graduate students, five responses from staff, and two responses from other users. No respondents reported being faculty members. This indicates that an undergraduate is slightly more likely to respond as a group room user than a graduate student, as the University reports having 18,862 undergraduates and 11,049 graduate students in 2019 (UNC-Chapel Hill, 2019). Group study rooms in the Davis Library stacks were the last rooms used by eighty-one respondents, and those in the Health Sciences Library were the last used by thirty-four respondents. Thirty-one responses came from those in the Undergraduate Library, thirteen came from the Davis Library Cubes, and two came from the Kenan Science Library. One more respondent was unsure of their last group study
room location. Graduate students were the most likely users of the Health Science Library Group study rooms, while undergraduates were the most common users of the other spaces, as shown in Figure 1.

Often, students were using the rooms for multiple purposes, such as working on a group project and studying for a class. In total, sixty users reported using the group study room to work on a group project (either academic or extracurricular), sixty-two users reported using the room to study with friends or classmates for the same class, forty-four users reported using the room to study for different classes with friends or classmates, thirty-two users used the room for independent study, and fourteen users reported using the room for socializing. Among the thirty-three users who reported using the rooms for some other purpose, fourteen were able to be redistributed back into the above categories of use (e.x. “transcribing interviews” was recategorized as “independent study”). Among the remaining nineteen “other” responses, five students reported using the room for teaching or tutoring, four students reporting using the room for remote conferencing, and
ten users reported using the room for interviews. Eighty percent of respondents reported using the rooms at least a few times a month, and thirty-six percent reported using the rooms at least once a week. Twenty-one respondents reported using the room alone, but twenty-four reported there being two people in the room during their last session. Fifty-one respondents reported three people in the room, twenty-five respondents reported four, twenty-six respondents reported five, and eight respondents reported there being six people in the room during their last session. A total of one group reported there being seven people in the room, two groups reported eight people in the room, and one group reported ten people in the room.

![Figure 2: Number of responses from users at each location by session subject, if specified. Color represents subject. Note that the locations are not to scale with one another.](image)
Users from the School of Public Health reported using the rooms more than any other department; twenty-six respondents indicated that the School of Public Health was their primary affiliation. Of these twenty-six, twenty used the Health Sciences Library, which is intuitive, as the Health Sciences Library is across the street from the School of Public Health. Biology and Business were the next-most reported departments, with fourteen respondents from each of these departments. One-hundred and six respondents reported working on something for a specific class while using the group study rooms; these classes were able to be coded into six categories: Health Science; Humanities; Language; Math, Statistics, or Computer Science; Science; and Social Science. The most use came from the Social Science group, which is a broad category containing departments such as Political Science, Business, and Economics; thirty-six percent of respondents who specified a subject fell in this group. Nineteen of these users reported working on a group project, and eighteen users reported studying either independently or with classmates. Of the twenty-seven respondents who were studying Science, which included subjects such as Biology and Chemistry, twenty-six were studying as a group or independently, with only one group working on a group project. Eight students were studying Math, Statistics, or Computer Science, and two of these groups were working on a group project; the rest were studying. Eight respondents were Language students; six were studying and three worked on a group project. Five respondents were working on other Humanities work; three were studying and three were working on group projects. Finally, nineteen respondents were doing Health Science work; twelve reported working on group projects and five reported studying.
The most used resources in the rooms were Wi-Fi and power outlets, with 143 users reporting using the power outlets during their sessions and 133 users using Wi-Fi during their sessions. Dry-erase boards were used by more than half of the respondents – ninety-five users reported utilizing that resource. That is sixty-five percent of the 144 users who remember dry-erase boards being present in the room they used. Only eight users utilized the display screens – twenty-seven percent of the twenty-nine users who indicated that display screens were present in their rooms. Only one user reported using the projector out of the three who remembered there being one present in their room.

Of those who reported working on a specific subject during their group study session, only two groups used the display screens, and both were Health Science users. Five of the eight students who reported studying Languages used the dry erase boards,
with one student saying “white boards are useful”. Twenty-six of the Science users also reported utilizing the whiteboards, while eighteen Social Science patrons used the whiteboards. Science users were the most likely not to use WiFi, with nine users not utilizing the resource.

4.1.2 Qualitative Data

Of the eighty people who explained how they used the dry erase boards, twelve reported using them for brainstorming, outlining, or in other ways planning for group projects. Five reported using them to practicing writing words or characters for foreign language classes. The remaining sixty-three utilized them to work out problem sets and equations for science or math classes such as biology, chemistry, math, or economics. Among the forty people who gave a reason for why they did not use the white boards, twelve users cited the fact that they did not have markers available in their rooms. The other students felt that they did not need the boards. Some stated that all of their work was done on their laptops, and one respondent explained that they would use the white boards when studying for exams to test themselves and practice, but not for completing homework.

Of the eight people who reported using the display screens, two reported using them to watch “the basketball game” while they worked. One group used them to watch videos for a class together, and four cited reviewing documents or software programs together. The final group used them to work with another group member via Zoom software. The respondent that used a projector used it to review a document. The other two users who remember there being a projector but did not use it simply said that they “didn’t need it”.
Of the 123 students who commented on their power outlet usage, twenty-three users reported using the power outlets to charge their phones, and all reported using them to charge computers. One student reported charging a tablet. Some students pointed that this outlet usage was due to the length of time they were on campus and the need to access notes, class materials on the internet, or word-processing software on their laptops. Of the nineteen users who gave reasons as to why they did not use the outlets, eight users simply said that they did not need them, while eleven specified that all of their devices were charged that day. Of the 116 students who reported on how they used Wi-Fi in their rooms, twenty-five specifically mentioned accessing Google Documents or Google Drive. One student mentioned accessing OneDrive, a cloud service to which the University subscribes. Four students mentioned using Zoom or Google Hangouts to collaborate remotely or complete interviews. Other students mentioned accessing homework or textbooks, and some students mentioned researching. Two students admitted to using social media during breaks. The three students who did not use Wi-Fi mentioned not needing their laptops for their session, suggesting that to some degree users are assuming that if they need their laptops at all they will need access to the internet.

Ninety-one students reported some sort of method of keeping shared notes. Fifty-eight of those reported using Google Documents or Google Drive to do so. Two people mentioned using Microsoft OneDrive, one person mentioned Dropbox, and another mentioned sharing a document in the Notes application for Mac OS. Many students reported taking photos of whiteboard diagrams, and others reported emailing each other files. When asked what students would add to the rooms if they could, eight students said
that they would have liked to have had displays available to them in the rooms, which suggests that students who need the displays are unable to identify or use the displays that are in rooms for some reason. Two students wanted adapters for these monitors. As adapters are available already for checkout in the Libraries, this suggests that students either do not know that they can check out adapters or are unwilling to spend valuable group study time going check one out. Two students requested more dry-erase board availability, and eight people requested better marker availability in the study rooms, often citing the frustration with having to go downstairs to circulation in Davis Library to get markers or frustration with the three-hour checkout period for marker kits, as students are often upstairs studying for longer than that. Four more respondents requested better marker quality. This group wanted both more markers that were not dried up and markers in a wider variety of colors for making diagrams. Two users requested remote collaboration tools such as cameras for video calls or phone lines. One user suggested installing a device that could scan white board information into a digital file, and another wanted a flip chart for taking group notes. Six other requests pertained to environmental factors, such as better lighting, seating, or ventilation, and came from users of the rooms in the Davis Library stacks, most of which contain some of the oldest furniture in the group study spaces.

4.2 Observation Results

A total of four observations were completed during the study period. Two took place in the Undergraduate Library, one took place in the Davis Library Stacks, and one took place in the Kenan Science Library. One of the groups was primarily composed of graduate students; the others were primarily undergraduates. Students observed were
working on a variety of projects; one group was studying for an upcoming humanities exam, one group was studying for an upcoming science exam, one group was working on a group project and conducting an interview for a social science class, and the final group was an extracurricular group working together on creating a shared document.

4.2.1 Findings

Generally, the observations echoed evidence from the surveys, but they also revealed some behaviors that the users may not be aware of. As the surveys suggested, many users are utilizing laptops and cellphones; almost all of those observed used their laptops throughout the observation sessions. More than three-quarters had their cellphones out as well. The cellphones were occasionally used to coordinate the arrival of other group members – those who were not the ones who had reserved the room often had some trouble locating the correct room – but more often the cellphones were occasionally picked up to respond to social messages or to check social media or sports scores. All groups remained constantly connected to the internet. The science group was the only group that did not utilize a shared group document such as a Google Document or a file in Google Drive. The extracurricular group used a Google Document to all work on the same document at once, while the social science and humanities groups expected others outside of the room to be contributing as well. The science group instead utilized Sakai to access practice problems, a resource also used by the humanities study group. The humanities group accessed both primary and secondary materials for studying via the internet, and the extracurricular group used Google to look up information throughout their meeting. The social science group also used Zoom software to record an interview. At no point did the users point out the fact that they were connecting to the wireless
network, highlighting the fact that students remain connected to the wireless network on campus throughout the day. All groups at some point used the power outlets to charge their laptops or phones.

Three of the four rooms had access to either a TV display or projector, but the only group that attempted to use it was the social science group; however, they quickly abandoned the attempt when they realized it would take them some time to figure it out. No one suggested getting an adapter from circulation to make the display work. In general, the groups did not have a need to use the displays anyway, as they all had access to all of the documents that they were using, either through Sakai or Google Documents. In the cases where someone did want to show others what was on their screen, they would rotate their laptop around on the table, a behavior exhibited in every group.

Writable surfaces were available in all of the rooms, and markers were present in three of the four. The only group that used the dry-erase boards was the extracurricular group, who used the board for the novelty of it towards the beginning and end of the session by drawing doodles that they left behind. This novelty use of the board was echoed by one survey respondent who said that they used the board to “write supportive messages”. The science group would have used the whiteboard to demonstrate to each other how they went about solving problems but expressed frustration that there were no markers available in the room – which was located in the Davis Stacks – and resorted to paper and pencil instead. This supported survey frustration about not having markers in all of the rooms with whiteboards. No one in that group suggested checking out a marker kit, and there were no instructions in the room that indicated that that was an option.
A few more observations pertained to behaviors that students were not necessarily cognizant of. Group members came in and out of the study room during the reservation periods. As mentioned above, students often had some trouble locating the correct room, and users often had to ask the previous users of the room to leave before they could use the space, especially during the afternoon sessions. One student mentioned that having a display screen that let students know what groups were in what rooms when could be useful. In addition, many students bring large backpacks into the spaces, which can make some of the smaller rooms more difficult to move around in. Finally, in the Kenan Science Library, which closes earlier than the other libraries with study rooms, a library employee came into the room to let the users know the library would be closing in fifteen minutes, at which point the students immediately began to pack up and leave. It was evident that this led the users to feel that they needed to leave the room before their reservation period technically ended, a point not made on the room reservation page. This could have been a distraction to a group or individual using the space to conduct an interview.
Discussion

With the findings now examined, the research question can be addressed:

How are students utilizing resources, such as display screens, projectors, and white boards, provided to them in reservable group study spaces in the University Libraries at UNC, to collaborate with one another, and how are they integrating their own personal technological devices with these resources? If they are not using these resources, are there clear reasons why they are not using them?

Students are more likely to use resources provided to them when they are available at the point of need and are unlikely to use resources if they feel they will take too much time out of their time together to figure out. Inconvenience frustrates students quickly. Convenience also plays an important role in which rooms students are likely to choose. In addition, much of the material and resources that students need are digital, and so efforts should be made to determine if there are ways that the library can help facilitate digital collaboration. Finally, students are using the group study rooms to find a private place to participate in remote collaboration efforts, both in the form of video or voice calling and in the form of shared Google Documents.

5.1 Convenience

5.1.1 Resources

As was evident in the findings of this study, students are unlikely to use resources provided to them for collaboration if they are not present at the point of need or if they are perceived as too difficult to use. This is especially true if there is an easy workaround for students to accomplish a similar goal. For example, as was demonstrated in one of the observation sessions, the best way for a student to demonstrate how they solved an
equation for a peer may be to use the whiteboards, but if the student must leave the study room - and current floor – to obtain dry-erase markers, they will likely simply demonstrate on a piece of paper instead. Students also fret about the three-hour checkout period for the markers, as groups that use the room for longer would have to remember to return them in the middle of a study session. The same was true for those users who needed to see each other’s laptop screens; using a display screen is ideally the best way for all users to be able to view one screen, but, most of the time, it is much easier for students to simply turn their screens around to show others. As group study room users typically all have laptops out and are frequently working on the same documents, users are often able to view the same documents on their individual screens.

It is logical to think that students want to make the most of the time they have set aside to meet with others, as those studying for exams, working on group projects, or even conducting an interview are often very aware that it is difficult for everyone involved to carve out time to be in the same place at the same time. Therefore, it makes sense that students would be quickly frustrated when trying to use a resource and would prefer to spend time going over material rather than attempting to set up the display screen or go retrieve a marker kit. The University Libraries should also see it as an accomplishment that the Wi-Fi is easy to use in all of the study rooms; it works well enough that students seemed to take it for granted in observation sessions. This ease of use could contribute to the reason that so many users report utilizing it in the survey results.
Several things could be done to make it easier for students to use underutilized resources in the group study rooms. The ideal solution for handling the distribution of dry-erase markers to users is to place markers in all the group study rooms. In north campus rooms that have markers present (those in the Undergraduate and Kenan Science Libraries), eighty-one percent of survey respondents reported using the writable surfaces, whereas only fifty percent of respondents reported using the writable surfaces in rooms where markers were not present (those in Davis Library Stacks and Cubes). While, in the researcher’s observations, there were always markers present in rooms where there should be, it could be that placing markers in all thirty-six group study rooms in the Davis Library stacks and seven Davis Library cubes puts too much of a burden on staff members and is overall too costly of a solution. In that case, efforts should be made to make the markers available closer to the users’ point of need. This could start with making it more prominently explicit that markers can be checked out from the service desk in the reservation process. Users could more easily obtain the markers when they walk past the service desk on the way to their room if they know they will need them ahead of time. In addition, signs could be added to the group study rooms themselves so that users would know where to get markers – or at least would know for the next time they use the room. Increasing the checkout period would also be helpful, as users are more likely to check out markers if they know they will not have to remember to interrupt their study session halfway through in order to renew the marker kit. Similar measures could be taken with display screens, and signage that provides instructions on how to use the screens could be added to the rooms.
5.1.2 Location

Convenience also plays a role in where students chose to use the group study rooms. This is evidenced by the fact that mostly graduate students use the group study rooms in the Health Sciences Library, while other group study rooms are more skewed towards undergraduate use. The Health Sciences Library is located towards the south side of UNC Chapel Hill’s campus and is surrounded by departments primarily home to graduate students, such as the School of Public Health, the School of Pharmacy, the School of Nursing, the School of Medicine, and the School of Dentistry. While certainly some undergraduates take classes in these buildings, they are much more likely to spend time on the north side of campus, where the other library locations that are part of this research are located. This also explains why the majority of Health Science use occurred in the Health Sciences Libraries. Knowing that a certain user group is likely to use rooms in a certain location could help to customize the rooms for the needs of that user group.

The Kenan Science Library group study rooms were less likely to be the last location a respondent used based on the number of rooms located there even though they are aesthetically appealing and have resources such as whiteboards available. This could be because the Science Library is tucked under one of the science buildings in a way that makes it inconvenient for many students to get to, and in fact many of the students in the group observed in this location had never been in the space before. This enforces earlier ideas that it is still essential that libraries retain locations that are central to campus life (Freeman, 2005; Montgomery and Miller, 2011; Mathews, 2016). The reduced usage could also be because the Science Library has shorter hours than the other locations in this study – it closes at 8pm on weeknights while none of the other locations close before midnight on weeknights. This was a problem for the group observed in the Science
Library, who usually meet until 8:30pm, but the other reservable group study rooms that were big enough to fit them were booked. Indeed, it seems that students often like to meet later after most classes are over and group members are more likely to be available.

5.2 Digital Resources
This research also points to the proliferation of students using digital resources in group study rooms. This is emphasized by the eighty-eight percent of users who reported using Wi-Fi in the rooms and the seventy-six users who reported bringing laptops into the space. This follows known patterns of users carrying around personal computing devices throughout the day (Bennett, 2003; Bailin, 2011; Kocevar-Weidinger et al., 2007; Straumsheim; Villanueva & Wong, 2007, Waters, 2001). This research found that students use these devices to collaborate on shared documents, access course materials, complete assignments, conduct research, and take some social breaks. As mentioned above, this points to the ease with which students are able to integrate their own devices with Wi-Fi and power in the study rooms. However, more could be done to determine if there are other digital tools that could aid students in collaboration and whether or not the University Libraries could help students to better utilize these sources. For example, only a few students report using Microsoft 365 software, a service that UNC-Chapel Hill subscribes to that could potentially make collaboration simpler for some students, and the Libraries could help students learn how to use this software. As Google Drive is the clear leading way that students are sharing documents, a workshop or web resource highlighting useful features for collaboration in this tool that users may not be aware of could be helpful as well.
With this proliferation of utilizing digital resources, it seems that display screens could be important resources for students to effectively collaborate in group study spaces, as they allow students to view digital documents at the same time. However, these devices are underutilized by students. As mentioned above, this seems to come primarily from issues of convenience. Giving more clear instructions on how to use the devices and checkout adapters could help to increase their use. The University Libraries may also consider wireless options for allowing students to send their personal screens to displays, as it would prevent students from having to obtain adapters for ever-changing ports and could potentially make switching between various group members’ screens a much simpler process. In addition, several students reported that they would have liked to have a display in their group study room, even though there are already underutilized displays in the study rooms on campus. Users could more easily reserve the rooms that contain resources they will need if the reservation page made information about which rooms contain which resources more apparent. As many displays are currently in the popular - but relatively few - Undergraduate Library and Health Sciences Library study rooms, it might also be beneficial to spread displays out across more types of study rooms, making it easier for those who actually want to use the displays to reserve rooms with displays.

While the display screens could potentially be greatly beneficial to students, adding them in ways that are inconvenient or not advertised well means that they will not be used to their full potential.
5.3 Remote Collaboration

5.3.1 Interviews and Conferencing

One of the interesting findings of this study is that users are utilizing the group study rooms to both conduct interviews and to be interviewed, remotely and in person. This makes some sense, as the rooms are relatively quiet spaces with neutral backgrounds and reliable internet connections, which allows students to feel confident that there will be no technical issues when participating in remote interviews and eliminates worries that something embarrassing might be present in the background of video interviews. The reservation aspect is also important here, as it allows students to be sure that they will have the space to themselves at the appointed interview time. It also is intuitive that students would occasionally use the room to video conference with other group members who could not be present to meet with everyone else.

Libraries could help students facilitate this use of the group study rooms in several ways. Some reservable rooms in the library could be specifically designated for interviews, which could both allow the resources in the rooms to be more targeted and to lessen the cases of single users taking space designed for use by larger groups. These rooms could be smaller, as often only one person is being interviewed, and would ideally be placed in a quiet location in the library. Hardware such as web cameras and microphones could be added to the space or specifically available for checkout, as could “Do Not Disturb – Interview in Progress” signs, to help reassure users that they will not be interrupted. On the software side, the libraries could provide workshops and web resources helping students understand how to use software such as Zoom or other video conferencing tools.
5.3.2 Google Drive Documents

One other area of remote collaboration is, once again, the use of Google Documents. Students use these resources to work with group members in the same room as them, but, as observational data shows, they also use them to collaboratively work with users not present. For example, students studying for an exam may create a study guide in a Google document during their group study reservation session that others outside the room may also be contributing to simultaneously. Interestingly, while this is an example of synchronous remote collaboration occurring in the group study room, students may also use these resources to work together asynchronously and extend collaboration past the group study reservation period. Students may start a study guide in a group study session that they expect others to add to as the exam time approaches, or they may start a folder for a group project that they assign other users to contribute to later.

Students seem to have an effective workflow for these digital tools for remote collaboration. However, the Libraries could potentially bolster users’ ability to work together remotely on the same document by introducing them to other tools to manage projects, especially those that allow for easy integration of Google Drive tools, such as messenger services like Slack or forum tools like Piazza. Libraries could also help students and their professors learn how to use Sakai – a tool almost everyone is already using on campus to manage course documents – to better facilitate study and project collaboration.
Conclusion

The reservable group study rooms in the University Libraries at the University of North Carolina at Chapel Hill are clearly filling a need for students to have a semi-private area in the libraries where they can collaborate with others without disrupting other library users. Students are using laptops and the internet to collaborate with each other and therefore commonly integrate their own personal devices with the provided sources of Wi-Fi and power outlets. Students have few complaints about these two resources in group study rooms. Many students utilize the writable surfaces in the spaces to demonstrate problem solving to others, collaboratively structure ideas, and practice exercises, and some find need for the displays and projectors to more easily collaborate with digital tools, but more could be done to make these resources easier for students to use.

Further research is needed to explain why students use the group study rooms for interviews and what – if any – resources those students need that the libraries could provide. More could also be done to determine if there are digital resources students might be unaware of – such as Zoom, features in Google Drive, or digital whiteboard tools - that aid in collaboration that would help group study room users collaborate more effectively. Libraries may be able to target guides or workshops at group study room users to help them with these resources. Research could also be done to determine why users are utilizing group study rooms over other options, which could possibly illuminate additional ways to improve the group study rooms. Finally, work could be done to
pinpoint resources that are especially useful to users studying specific disciplines, and those resources can be concentrated closely to where those students often go on campus.

Students expect group study rooms in academic libraries to provide a space to collaborate with others and also expect that the resources provided in those rooms will aid them in this endeavor. This is especially important as more professors assign collaborative work. Users require these resources to be convenient to use and to integrate with their personal resources that they carry throughout the day, such as laptops, as they are generally not willing to take time out of their reservation period to troubleshoot or gather additional resources, such as dry-erase markers or display adaptors. Group study room users also need convenience in the location of the rooms for themselves and their group members in order to maximize the amount of time they have to work together, which contributes to the argument that it is still necessary for library spaces to be at the core of university campuses. The University Libraries can continue to respond to the increasing assignment of collaborative work by ensuring that resources provided in group study rooms are intuitive and convenient for patrons to use and by providing them with additional opportunities to improve their skills at utilizing the digital tools they already use.
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Appendix A: Survey of Group Study Room Users

University of North Carolina at Chapel Hill
Research Information Sheet
IRB Study #: 19-0150
Principal Investigator: Ellie Edwards

The purpose of this research study is to see how people are using reservable group study rooms to facilitate collaborative learning in the University Libraries at UNC Chapel Hill. Specifically, the study aims to learn more about how resources are being used in these spaces for collaboration. You are being asked to take part in a research study because you recently reserved a group study room in the University Libraries.

Being in a research study is completely voluntary. You can choose not to be in this research study. You can also say yes now and change your mind later.

If you agree to take part in this research, you will be asked to answer a few survey questions about your experience using group study rooms in the University Libraries. Your participation in this study will take about 10 minutes.

You can choose not to answer any question you do not wish to answer. You can also choose to stop taking the survey at any time. You must be at least 18 years old to participate. If you are younger than 18 years old, please stop now. Your choice to participate or not participate will in no way effect your employment, access to UNC resources, or grades.

The possible risks to you in taking part in this research are:
In the event of a data breach, others finding out that you have completed this survey and viewing your responses.
The possible benefits to you for taking part in this research are:
Contributing to a greater understanding of how group study rooms are being used in the University Libraries.

To protect your identity as a research subject, the researcher will not share your information with anyone. In any publication about this research, your name or other private information will not be used.

If you have any questions about this research, please contact the Investigator named at the top of this form by calling 704-533-0311 or emailing elliee@live.unc.edu. If you have questions or concerns about your rights as a research subject, you may contact the UNC Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.
Screening Question
1. Have you used a reservable group study room in a library on UNC’s campus before? (If no, end survey)

Part 1: Session information
1. What is your affiliation with the University?
   a. Undergraduate Student
   b. Graduate Student
   c. Faculty
   d. Staff
   e. Other:
2. What University department are you affiliated with (if you are an undergraduate, what is your major)?
3. On average, how often do you use group study rooms in the University Libraries?
   a. Every day
   b. A few times per week
   c. Once per week
   d. A few times a month
   e. Once a month
   f. A few times a semester
   g. Once a semester
   h. Almost never
4. Approximately when was the last time you used a reservable group study room in a library on campus?
   a. Today
   b. This week
   c. Last week
   d. A few weeks ago
   e. Last month
   f. A few months ago
   g. Last semester
   h. A few semesters ago
   i. Last year
   j. A few years ago

When answering questions 5-9, please recall the last time you used a reservable group study room on campus.

5. Where was the group study room you used during that session located?
   a. Davis Library stacks (Davis Library floors three-eight)
   b. Davis Library cubes (on the second floor of Davis Library)
   c. Undergraduate Library
   d. Kenan Science Library
   e. Health Sciences Library
   f. Other (please specify):
6. How many people were using the group study room during that session?
7. What was your purpose for reserving the room? Please select all that apply.
   a. Working on a group project
   b. Studying for the same class with friends/classmates
   c. Studying for different classes with friends/classmates
   d. Socializing
   e. Independent quiet study
   f. Other (please explain):
8. If you were working on a project or studying for a specific class, please specify the course department.
9. Which best describes that session?
   a. I reserved the group study room myself.
   b. Someone else in my group reserved the group study room.
   c. My group used the study room without making a reservation.

Part 2: Resources Used
When answering questions 10-15, please recall the last time you used a reservable group study room on campus.
10. During your last session in a group study room, which of the following resources do you remember being in the room? Select all that apply.
   a. Display screen/monitor
   b. Projector
   c. Wi-fi
   d. Dry-Erase Board
   e. Power Outlets
11. During your last session in a group study room, which of these resources did you use, and what did you use them for?
   a. Display screen/monitor:
   b. Projector:
   c. Wi-fi:
   d. Dry-Erase Board:
   e. Power Outlets:
12. Why did you choose not to use these resources in your last session?
   a. (list of resources not selected in last question)
13. Where there any resources that you or a group member checked out of the library to use in the group study room during your last session (e.g. marker kits, display port adaptors, laptop chargers, etc.)
   a. What did you use these resources for? (will display if they indicate yes to question 13)
14. Were there any of your own resources that you used in the group study rooms (e.g. laptops, cell phones, sticky notes, dry erase markers, display port adaptors, etc.) during your last session?
a. What did you use these resources for? (will display if they indicate yes to question 14)

15. Was there a method that you used to keep common notes as group during your last session? If so, how did you share them among the group members (e.g. common Google or Office 365 document, writing notes on whiteboard and taking photographs, etc.).

16. Are there any resources missing from the group study room that you used that could help you collaborate better with group members? If so, how would you use these resources if you had access to them?

Part 3: Invitation to participate in observation session

If you are willing to allow the researcher to observe your next group study session, please provide your email address below. Your email address will only be used to identify where and when your next group study session is and to notify you that your session has been chosen to be observed. Your identity will be kept confidential and not used in any publications about this research. Before the observation begins, the researcher will confirm that all group members are willing to be observed.
Appendix B: Observation Guide

Observation Number ____

Consent Script (to be read before beginning the observation)

University of North Carolina at Chapel Hill
Research Information Sheet
IRB Study #: 19-0150
Principal Investigator: Ellie Edwards

The purpose of this research study is to see how people are using reservable group study rooms to facilitate collaborative learning in the University Libraries at UNC Chapel Hill. Specifically, the study aims to learn more about how resources are being used in these spaces for collaboration. You are being asked to take part in a research study because you are using a reservable group study room in the University Libraries.

Being in a research study is completely voluntary. You can choose not to be in this research study. You can also say yes now and change your mind later. Your choice to participate or not participate will in no way effect your employment, access to UNC resources, or grades.

If you agree to take part in this research, you will be asked to allow the investigator to observe your group study room reservation session and take notes on how you use resources for collaboration during the session. You will not be asked to modify the way you use the room in any way. Your participation in this study will take as long as you plan to use the group study room. We expect that about 60 people will take part in this research study.

You can choose to stop the observation session at any point by indicating to the researcher that you would like to withdraw from the study. At that point, the research would leave the room and delete any records of the observation session. You must be at least 18 years old to participate. If you are younger than 18 years old, please indicate that the observation session should end now.

The possible risks to you in taking part in this research are as follows:
In the event of a data breach, others finding out that you have taken part in this observation session and the researcher’s observation notes.

The possible benefits to you for taking part in this research are as follows:
Part 1: General Session Information

1. What is the location of the study session?
   a. Davis Library Stacks
   b. Davis Library Cubes
   c. Undergraduate Library
   d. Kenan Science Library
   e. Health Science Library

2. How many people are using the room?
   a. If this number changes over time, please note this.

3. How long did the session last?
   a. Does this differ from how long the room was reserved for?

4. In general terms, what is the subject of the meeting? (e.g. biology, history, standardized test prep)

5. Which of the following describes this meeting?
   a. This is a group project meeting.
   b. This is a group study session with all users studying the same topic.
   c. This is a group study session with all users studying/working on different topics.
   d. This is a social session.
   e. This is individual quiet study.
   f. Other (describe):

6. Do the users appear to be:
   a. Undergraduate Students
   b. Graduate Students
   c. Faculty
   d. Staff
   e. Other (describe):

7. Which of the following are available in the room? Note number available if applicable and anything notable (e.g. any broken equipment).
   a. Wi-Fi
   b. Power Outlets
   c. Display Screens
d. Writable Surfaces

e. Projectors

Part 2: User Behavior Descriptions

8. Of these items available, list those that the users utilize in this session and describe how they use them.

9. Of these items available that were not utilized in this room, describe any reasons that users did not have use them, if discernable.

10. Did users appear to bring any objects into the room that were checked out from/provided by the library? If so, how and when did they use them? Was there anything notable about the items themselves? (e.g. marker kits or port adapters)

11. Did users utilize any resources of their own in this session? If so, did they integrate them with the resources provided in the room? If so, how? Were there any issues with this process? Answer these questions for any items used.

12. Are users communicating with each other? If so, how? Note any changes over time.

13. Are notes being taken in any way? If so, describe how.

14. Please describe anything else notable about the session, paying careful attention to anything that pertains to collaboration and resources, both those provided in the room and those that users bring in themselves.