

Winter 2017

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Recommended Citation

Baril, Kathleen, and Kelly Kobiela. "Reimagining the Library: Designing Spaces to Meet the Needs of Today's Students." *Council on Undergraduate Research Quarterly*, vol. 1, no. 2, Winter 2017, pp. 18–23. Crossref, doi:10.18833/spur/1/2/9.

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Reimagining the Library: Designing Spaces to Meet the Needs of Today's Students

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Abstract

Libraries, long the heart of academic life, nonetheless have been perceived as a passive space for physical resources and quiet study. Changes in the dissemination of information, as well as teaching and learning methods that focus on high-impact practices, have driven library staff to reimagine the physical buildings of libraries. To meet the new needs of students, Ohio Northern University planned a full renovation of the first floor of its undergraduate library. Current space and space usage was analyzed, considering how collaborative learning and undergraduate research might be conducted in renovated spaces. Ethnographic studies such as observations, focus groups, and surveys were used to learn how students studied and how they used the space. Assessments completed after renovation revealed that the new space appealed to students and reflected improvement as studying and learning spaces, but further studies are needed.

Keywords: *academic library use studies, ethnography, library facilities, library space, user-centered design*

doi: 10.18833/spur/1/2/9

Although libraries have been the center of academic life for a long time, they may only be perceived as quiet places to study and find books rather than as part of the larger learning environment on campuses. At Ohio Northern University, students engage in a variety of high-impact practices as defined by Kuh (2008, 9–11), including first-year seminars, capstone courses and projects, collaborative assignments and projects, and undergraduate research. Heterick Memorial Library, the undergraduate library at Ohio Northern University, provides extensive

assistance to students with research through information literacy sessions embedded in courses, but the library's space did not adequately support undergraduate research and learning. With administrative funding and a generous donation, the library's first floor was transformed into a learning space for the twenty-first century that supports undergraduate research and active learning by adding collaborative spaces and new resources.

Literature Review

In the last 20 years, academic libraries have slowly migrated from passive facilities housing books to dynamic learning spaces that fully support the learning of their institutions. Many libraries now have spaces designated for quiet study and more interactive work, along with individual and collaborative zones, that have new technology supporting students and their research. Library literature has extensively covered this shift in libraries' missions as they adapt their spaces to respond to changes in pedagogy at their institutions and in the dissemination of information (Beagle 1999; Lippincott 2012; Lowry 1994; Seal 2015; Steiner and Holley 2009). Several researchers also have studied how students use library space and how space may be best designed to meet students' study and research needs (Andrews and Wright 2016; Foster and Gibbons 2007; Harrop and Turpin 2013; Montgomery 2014). Most literature on student research and libraries focuses on course-related research and study rather than undergraduate research as defined by the Council on Undergraduate Research: research "that makes an original intellectual or creative contribution to the discipline" (CUR, n.d.). As a result, very little research exists on the intersection of undergraduate research and library space.

Stamatoplos (2009) writes extensively about how libraries could become more involved in supporting undergraduate research, but he focuses on the human aspect and examines how the library can make connections with faculty and students. Two articles did include library space as part of larger studies on undergraduate research and libraries. Hensley and colleagues (2014), in a large survey study of academic libraries, found that 54.9 percent of the surveyed libraries provided space specifically for undergraduate research, which ranged from individual study carrels to collaborative spaces. In a smaller study, Wiebe (2016) surveyed students at his institution and found that 71 percent utilized the open tables and chairs, and 66 percent used the quiet study spaces in the library while doing their research. Wiebe (2016) also noted that five students wrote in the comments section of the survey that they met fellow student researchers in the library. These two studies provide some evidence that library space can support and encourage undergraduate research.

Design of the New Space

As planning began for the first-floor renovation at Heterick Memorial Library, the renovation committee considered the learning goals for Ohio Northern University's students, including high-impact learning practices such as undergraduate research. The committee consisted of a cross-section of campus stakeholders, including faculty, students, physical plant representatives, administrators, librarians, and educational technology and information technology staff. Creating a learning space that would meet institutional needs began by studying the primary users of that space: the students.

Increasingly, academic libraries are utilizing ethnographic studies to obtain data on how students research and study. Ethnography is "the act of collecting information" and also the "resulting detailed written work on a people, their society, and culture" (Steele et al. 2015, 24). In an educational setting, it is important to observe how students currently work so that a space can be provided that will foster study and research and be attractive for these endeavors. In 2012, Khoo and colleagues conducted a review of libraries that had completed ethnographic studies; at that time, there were only 81 examples, most of which had been published in the mid-to-late 2000s (86). They found that ethnographic studies in libraries have been used for everything from evaluating information literacy to space planning in an attempt to gain information on students' use of library services and spaces. One of the first ethnographic studies on library spaces was in 2004 at the University of Rochester (Foster and Gibbons 2007) in which they conducted interviews and design workshops to look at library space in relation to student research papers. Another long-running ethnographic library project, the ERIAL project, involved five academic libraries and employed interviews, photo journals, web design workshops, and

student research journals to study library users (Asher et al. 2012). Other libraries have used ethnographic studies to analyze space, including Andrews University, which conducted an ethnographic study in its library "to determine and identify the types of spaces students at Andrews University prefer and use in order to enhance their learning experience" (Oliveira 2016, 357). Throughout the renovation of the first floor of Heterick Memorial Library, the library and the first-floor renovation committee used several qualitative ethnographic studies, because collecting qualitative data can help "understand complex emotional responses and can lead to understandings" that are not possible using only quantitative data (Jervis and Drake 2014, 234). Quantitative ethnographic methods also were applied to help determine the changes that would enhance student learning. In general, how students used the space was examined, but information on specific uses was not gathered, such as whether the space was used for studying, group projects, research, or extracurricular activities.

To begin the evaluation of the first floor of the library, a space study was conducted to determine what spaces students were using and when they were using those spaces. A space study usually incorporates various ethnographic methods to study students and the ways they use a learning space (Harrop and Turpin 2013; Hobbs and Klare 2010). Both a photo study and seating counts were used. The space study was conducted one week in late February 2014 and one week in late April/early May 2014. Maps were created that divided each floor of the library into three or four zones. Each day, a librarian or library staff member counted the number of students sitting or standing in each zone every two hours (for example, at 9 a.m. and 11 a.m.) and recorded the numbers on a map (see Figure 1). Photos were taken at predefined spots throughout the library to qualitatively look at what students were doing in the space. From the space count data, zones on the first floor that contained computers, both within the computer lab and outside the lab, were the most used spaces (see Figure 2). On the library's second floor, zones with group-study rooms had the highest usage, although open areas with large tables also were highly utilized. Unfortunately, the results from the photo study did not provide any additional insight into how the students were using the library's space. The space study overall demonstrated that computers and group space were important for student work.

To further understand what created a productive study and research environment for students, the library undertook a two-part evaluation in fall 2015. First, the library conducted sessions with two student focus groups and one faculty focus group. The student focus-group invitations were emailed to all undergraduate students and explicitly stated that students did not have to use the library to participate, so that feedback could be obtained from users across campus rather than confined to current library patrons. Students

FIGURE 1. Map of the Heterick Memorial Library's First Floor with Space Study Zones Marked

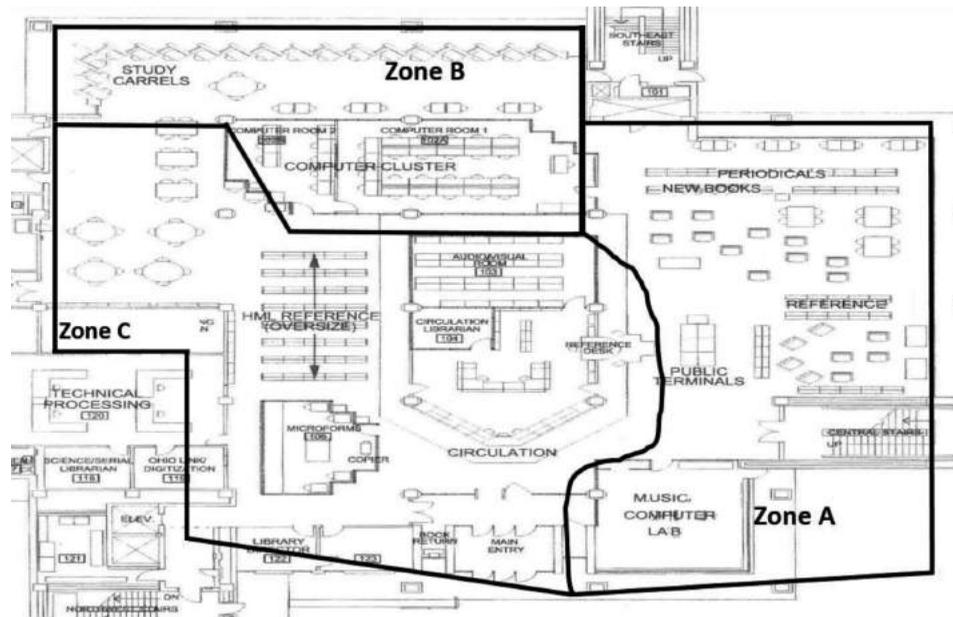
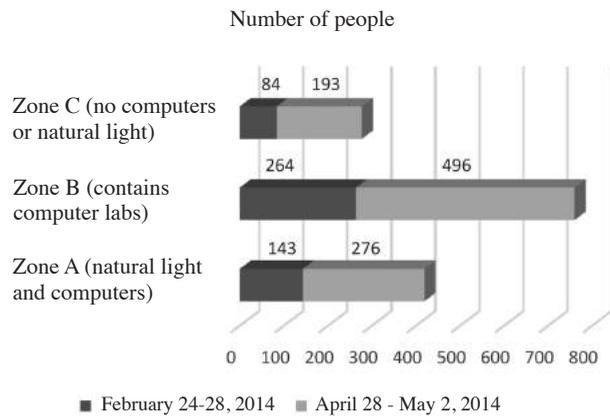


FIGURE 2. Study Results, First-Floor Space



were offered a free pizza lunch for their participation. The focus groups were run as informal sessions with questions designed to prompt answers, so students felt comfortable talking to each other and the librarians about their likes, dislikes, wants, needs, and dreams for the first floor.

The next step in the user-centered evaluation process was conducting an online survey. Through qualitative information gathered from the focus groups and assistance from professors from sociology, business, and statistics, a survey was crafted that concentrated on issues and ideas highlighted by the focus-group participants. Questions were posed about study habits, space needs, and atmosphere preferences. Also included were questions about preferences for specific pieces of furniture, and desired food and

beverage options for a potential coffee shop. The survey was sent out to all undergraduates; the response rate was approximately 25 percent, with representation from all four undergraduate colleges. To encourage participation, survey respondents were entered in a raffle for an Amazon.com gift card. Faculty members received a similar survey in which they were asked about their perceptions of student preferences. One survey question specific to faculty asked, “What learning spaces could the library add that would enhance current learning spaces?”; half of the respondents indicated that spaces that allowed group work would be beneficial.

In both the focus groups and survey, the students frequently indicated that working in groups was an integral part of their studying and learning, which reflects the emphasis on collaborative learning at the university. Sixty-two percent of the students indicated in the survey that they study in a group at least weekly, with 15 percent indicating almost daily group-study work. Seventy-six percent gave a preference for separate group-study space, so that they could have a space for study and discussion, whereas 85 percent indicated that large tables for their work were a priority; in the focus groups, the students indicated the large tables were desirable, because multiple students could study together, or individuals could spread out their work. Although a variety of opinions were given about specific furniture pieces, most students expressed the desire to be comfortable while studying, with 79 percent designating comfortable chairs or couches to be important. Students also responded in the survey that other features created a more effective study environment; 96 percent of students

marked access to Wi-Fi as very important, whereas 69 percent indicated access to food and drink as important, and 54 percent noted that whiteboards were important to them while studying (see Tables 1 and 2 for further details).

A space was created that incorporated the results of the ethnographic studies and thus contained the following: plentiful outlets, a welcoming and modern atmosphere, places for group study and technology to support effective collaboration, a variety of seating to accommodate the different learning goals and different study styles of students, and a cafe for sustenance while researching and studying.

Assessment

For assessment measures, a variety of qualitative and quantitative measures was used to gain insight into the level of success of the renovation and its support of

student research and learning. The reaction of students to the renovation was overwhelmingly positive. In the fall semester after the renovation, gate count numbers indicated an increase in library patrons of 15 percent from the previous fall semester. Beginning in October 2016, the spaces used by students began to be tracked through gathering data on where students were in the building four times a day Monday through Thursday and three times a day Friday through Sunday. Library student workers walked around the building and recorded the data on maps; these data were then entered into spreadsheets by full-time library staff members. The data collected from October through December demonstrated that more students occupied the newly renovated first floor as compared to the other two floors. In total, 18,325 patrons were counted with 8,323 (45.42 percent) on the first floor, 6,862 (37.45 percent) on the second floor, and 3,140 (17.14 percent) on the third floor. Booths were the most preferred open seating and were filled on average 24.9 percent of the time. The four group-study rooms on the first floor were the most preferred places to sit and were filled 35–40 percent of the time.

During spring 2017, the library conducted a survey of undergraduates to determine the success of the renovation. Although the response rate of the survey was lower than what would have been desirable (approximately 11 percent of the undergraduate student body), the respondents included a good representation of the four undergraduate colleges and undergraduate class years. In part, the success of the renovation was measured by comparing this survey's results to the results of the survey conducted prior to the renovation. Prior to the renovation, 7.94 percent of the student survey respondents said they visited the library on a daily basis, and 15 percent said they visited on an almost daily basis. After the renovation, 15 percent of survey respondents said they visited the library on a daily basis, and 21 percent visited on an almost daily basis.

To gather qualitative data, a focus group was conducted with students from three of the four undergraduate colleges. These students were recruited through the dean's advisory groups of each undergraduate college, and only one college did not have any students volunteer. Volunteers were offered a free pizza lunch for their time. All student participants agreed the renovation made the library more welcoming and that they enjoyed having a "noisy" floor in the library. Students noted that several amenities aided their studies and helped them succeed in classes. The students reported these outcomes themselves; specific outcomes were not gathered such as grades received in courses or for specific assignments. The students found the new whiteboards useful for writing out equations and working with groups. The group-study rooms also were described as helpful for group projects and senior capstone

TABLE 1. Student Survey on General Study Aspects

Question: How important are the following to you when studying?	Percent responded: Very important or somewhat important
Wifi and Internet connections	96%
Access to places to charge devices, including laptops, tablets, and phones	92%
Lighting	87%
Access to printers	86%
Large space or tables on which to work	85%
Comfortable lounge chairs or couches	79%
Group space for study and discussion	76%
Food and drink	69%
Whiteboards	54%
Access to specific software (i.e., Autocad)	33%

TABLE 2. Student Survey on Group-Study Aspects

Question: What features do you need in a space for group study or collaborative study?	Percent responded: Necessary or very necessary
An open space where talking is permitted	76%
An enclosed study space	68%
Technology to view or use materials (large monitors, projectors, smartboards, etc.)	61%
Whiteboards	61%
Technology for creating (computers, software, printers [3D, color, etc.]	56%
Other	24%

meetings. One student said that since the renovation, the library had become a place that students wanted to utilize to meet for various projects.

On the survey, a similar question to the one posed to the focus group was asked regarding learning outcomes and the first-floor renovation. When asked if any specific learning goals were met by the new features on the library's first floor, 33 percent of survey respondents indicated that group and collaborative work were better supported, with 20 percent of survey respondents noting that the enclosed group-study rooms in particular were very helpful. Fifteen percent of respondents also wrote that the whiteboards in the study rooms and throughout the first floor were helpful for a variety of learning goals, including group work. When answering an open-ended question about their favorite part of the renovation, 24.9 percent of respondents chose elements related to the design, including the colors, the open layout, and the modern design. As one student wrote, "It makes it more fun to do school work when it looks like an exciting place to be."

Several faculty members were interviewed regarding the impact of the library's renovation on their specific courses and departments and any of the high-impact practices. Several professors cited the new collaboration spaces as especially valuable for the projects and papers they assigned. A professor from electrical engineering noted that, although students conduct individual research in one course that he teaches, the entire class meets to discuss the research in the library's new group-study rooms, as the television monitors allow class members to share research results easily. A chemistry professor noted that several classes in the department involve collaboration; for example, in a physical chemistry class, students work in groups to complete literature reviews on lab research. He stated that the new library group-study rooms would be ideal for these students to accomplish their research.

In reviewing assessments, the positive feedback received reflects a variety of changes that support undergraduate research such as increasing collaborative spaces, adding technology to assist with collaboration, and adding various design and physical elements to enhance the atmosphere. As one survey respondent wrote, "an open learning environment helps a lot with small group studies and brainstorming sessions," because students now feel they are allowed to speak freely on the first floor. Communication is a key point in encouraging collaboration, because, as Kuh states, one of the goals of collaborative learning is "sharpening one's own understanding by listening seriously to the insights of others" (2008, 10). Students not only noted the group-study rooms as a contributing factor to the increased ability to collaborate but also indicated that various configurations of furniture throughout the first floor, along with the change in atmosphere, all promote talking

and socialization. Other elements that encourage collaboration include monitors in all group-study rooms on the first floor and the increased number of outlets throughout the first floor. The first floor, once a quiet space, is now a true social space for collaboration.

Conclusions

Overall, the library renovation was successful due to the high degree of participation by a large number of campus stakeholders, especially students. In retrospect, it would have been advisable to examine how all of the high-impact practices might have been supported in the space renovation instead of just collaboration. Some inferences can be drawn about how the space is currently supporting undergraduate research, but future research is needed to provide data to support inferences. For example, it could be assumed that group-study rooms provide excellent places for professors and students to meet to discuss and plan research (with facilities for snacks and coffee), and furniture such as the booths can assist in accommodating collaborative undergraduate research meetings. In some disciplines, the addition of whiteboards also could benefit undergraduate research.

As the library literature demonstrates, the relationship of undergraduate research and libraries is an underresearched area. Much is still to be learned about how libraries can assist and support undergraduate research through library services and spaces. For example, do different disciplines have different needs for undergraduate research? Some disciplines require specialized equipment and spaces that perhaps the library cannot provide, whereas others only require access to electronic resources and a place conducive to reading and writing. Since undergraduate research differs from course-related research in that often students work one-on-one with their faculty mentors, libraries might study what spaces they could provide to facilitate these interactions.

As libraries continue to adapt their missions to the new teaching and learning initiatives at their institutions, including undergraduate research, librarians will need to continue to consult with faculty, administrators, and students to create spaces that maximize learning opportunities and support student success in all of the high-impact practice areas.

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