

DO YOUR LIBRARY SPACES HELP ENTREPRENEURS? SPACE PLANNING FOR BOOSTING CREATIVE THINKING

Mark Bieraugel

ABSTRACT

Supporting entrepreneurship and innovation is a goal for many college campuses. How can your library support those goals? Should you add a maker-space to your library? Or make other costly changes? Library spaces help students think at a higher level, to be creative, innovative, and entrepreneurial. It is rare to have a dedicated spot on campus for thinking. Our libraries are those spaces. Spaces that strongly foster entrepreneurial thinking range from quiet reflective spaces to noisy collaborative spaces. You do not need to do an elaborate study to understand your library spaces. To assess your library spaces as they relate to innovative and entrepreneurial thinking, first take an inventory of your existing library spaces. By examining your existing spaces and the activities in them, you see which of the six essential types of spaces you have and which ones you lack. Once you have done a space assessment, you can see how you can readily add any of the six spaces you lack. A case study of an academic library's space inventory, assessment, and recommendations helps illustrate the process. You use your space inventory for present and future space planning and to communicate your worth to your stakeholders. Libraries can market unique spaces to students (e.g. "Here are spaces to help you think creatively"), support Creative Campus initiatives, and promote library spaces which foster entrepreneurial thinking.

Keywords: Space planning; entrepreneurship; makerspaces; assessment; sweeps; building

Academic libraries traditionally support student entrepreneurs with information resources, library guides, and research consultations with librarians. However, academic libraries do much more than that. They also provide spaces where student entrepreneurs can think, work, create, and innovate.

Previous research on spaces in academic libraries and on campus proved that certain types of spaces fostered entrepreneurial thinking and behaviors in students (Bieraugel & Neill, 2017). The research found that six different types of spaces fostered entrepreneurship. The six distinct spaces that help entrepreneurs are collaboration rooms, communal tables, computer labs, green spaces, maker-spaces, and solo spaces. The study examined a number of distinct spaces within the library and throughout campus, including a university union, a large open lawn, and a makerspace. Not all spaces fostered entrepreneurial thinking and behaviors, but those that significantly helped students were included in the top six list. This research found that students use different spaces to observe, question, experiment, network, or reflect. Students also explore or exploit ideas when in these spaces.

WHY DESIGN FOR STUDENT ENTREPRENEURS?

All students need to think creatively and innovatively, whether it is for their studies or for other aspects of their lives. No matter where students may work in the future, they will need to be creative thinkers and problem solvers. Why design your library spaces for entrepreneurs? Institutions hold high goals for their students: not just that they learn, but that they experiment, explore new ideas, and create something new. In short, they act entrepreneurially. In designing your library spaces for entrepreneurs, you are designing for a higher level of thinking and learning.

LIBRARY SPACES SUPPORT UNIVERSITY GOALS AND OUTCOMES

Academic libraries align themselves with institutional goals, learning outcomes, and other initiatives. Databases, books and ebooks, librarians, and library staff are frequently cited as means of support for these goals and outcomes. Library spaces are often neglected in the list of assets. Watson (2013) notes it is helpful to think about library spaces as services. Your library has multiple spaces, thus, your library offers multiple services. Your library needs to have six distinct spaces to foster entrepreneurs.

By highlighting the distinct spaces in your library as assets to student entrepreneurs, you demonstrate your commitment to their needs and your support of student learning, engagement, and entrepreneurialism. You also communicate your value to stakeholders. If you work at a business library, it is even more crucial that you demonstrate your value to entrepreneurs.

To understand your spaces, you must assess those spaces to further define the value of your library (Nitecki, 2011). Identify the spaces you already have, then determine which new spaces you should create to support entrepreneurs. Doing

this will help you understand the diversity of your library spaces. By assessing your spaces and recognizing their value for student learning, creativity, and innovation, you can communicate that information to your stakeholders, supporters, alumni, and donors.

THE SIX SPACES

The six spaces that foster entrepreneurs are collaboration spaces, communal tables, computer labs, green spaces, makerspaces, and solo spaces. Collaboration spaces are where two or more people work together. Communal tables are where students can work together or alone at large work tables. Green spaces are any place with plants, trees, or natural features. Makerspaces include both traditional high technology and simpler technologies. Solo spaces are single desks or chairs that allow students to work alone.

WHAT YOU ALREADY HAVE: SPACE ASSESSMENT TOOLS

Methods to assess spaces and the activities for which they are used range from quick and simple to complex and time-consuming.

Floor Plan + Walkthrough: Simple and Quick

The simplest method of assessing space is to first study the library's floor plan and note each of the different types of spaces. Then do a walkthrough of the entire library to see how furniture and other elements influence the use of the space. It is helpful to take photos of spaces during the walkthrough to remember which areas foster entrepreneurs.

Benefits and Costs

The benefits of the floor plan and walkthrough method are ease and speed, and the process can be accomplished by a single person. This process quickly determines which of the six types of spaces you have and which types you are missing. However, this method only provides a surface understanding of how your spaces are used. It does not capture how students use each of the library spaces, particularly if a space is being used contrary to how it was designed. Metrics such as foot traffic, noise levels, student demographics, or student activity and interactions are also missing. That does not invalidate this method as a fast way of learning more about your existing spaces and what you might need. It simply leads to the need for further data acquisition.

Floor plan + walkthrough is the assessment method used for the case study discussed later in this chapter. [Table 1](#) is used for the floor plan + walkthrough method described earlier. It can also be used to chart your results using the other evaluations methods listed in the forthcoming text.

Table 1. Sample Space Survey.

The Six Spaces	What You Have	What You Need
Collaboration space		
Communal tables		
Computer lab		
Green space		
Makerspace		
Solo space		

Seat Counts, Sweeps, and Suma

Sweeps and seat counts represent the next level of complexity in space assessment. Sweeps are “systematic observations to chronicle how patrons use the building’s space and equipment” (Linn, 2013, p. 511). Sweeps can capture simple data, such as how many people are in a space at a particular time, or more complex data, such as student interactions within spaces. Traditionally, sweeps have used printed forms, but new tools allow you to capture the sweep data via tablets or smartphones.

One digital tool for gathering space use data is Suma, a mobile web-based application created by North Carolina State University (Suma, 2014). Used with a phone or tablet, Suma assists in collecting data on your spaces. Suma can do simple headcounts of people in spaces and gather specific data about student behavior in those spaces. For example, is a student using a laptop, or are students studying alone or working together? These data offer a more detailed picture of how spaces are actually used by students. Once the data are collected, Suma has a variety of reporting tools to visualize the data and assist with analysis.

Benefits and Costs

A benefit of using Suma is that you are required to assign names to each space you study, thereby giving you a list of existing spaces within your library, which you can then use in your gap analysis. Suma helps determine if your spaces are well used or underutilized. These data can be used to support adding similar spaces to your library.

Of course, Suma cannot capture student demographics or what students are thinking in your spaces. As an open source tool, it requires IT assistance to install and maintain. On the front end, work is required to determine your spaces, identify the data you need from each space, and enter those spaces into the application. Gathering the data and ensuring data hygiene cost time and labor. The final steps are analyzing the data and taking action on what you learned from the data.

Once you have gathered sweeps data, you can see how your spaces are used and how much they are used. Those data help you to know what spaces to

expand. Since you have designated each space type in your sweeps, you will know which of the six entrepreneurial spaces you have and which ones you lack. Also, you can see not only what spaces to add to foster your entrepreneurs, but also what areas you need to expand.

Sticky Notes and Whiteboard Data Gathering

Another method for gathering information on student space use involves whiteboards and sticky notes (Ippoliti, Nykolaisyn, & German, 2017). Position a whiteboard near the space with a question or prompt written on it. Students are encouraged to write a response about their experience working in that environment on the board or on sticky notes. Typical prompts or questions include: if you could change anything about this space what would you change, what do you do in this space, and why don't you use this space?

Benefits and Costs

The benefits of this system include the ease of setup and information gathering, low cost, and lack of technical work to create an area for feedback on your spaces. The downside is a lack of control over what students write, the time required to transcribe and code the responses, and the challenge of analyzing the student responses. Also, the small size of a sticky note can limit the size and depth of a student response.

Using sticky notes and whiteboards for information gathering is limited in that you do not actually assess the types of spaces you currently have and what spaces you need for entrepreneurs. You must do a floor plan and walkthrough assessment in addition to this method to know what spaces you need.

Surveys, Interviews, and Focus Groups

To gather in-depth usage data, a number of tools are at your disposal. Surveys, interviews, focus groups, and diaries can all collect rich data about how students use your diverse library spaces. I have used surveys to gather information on how my library's spaces are used, who uses them, and whether they are fostering or hindering entrepreneurial thinking and behaviors (Bieraugel & Neill, 2017).

However, since you are studying students and not just counting them, these methods may require approval from your institution's Institutional Review Board (IRB) or equivalent body overseeing research with human subjects. With these more invasive data collection methods, the ethical and privacy issues involved in collecting, storing, using, and disseminating the data must be considered.

Surveys

Assessing student behavior in spaces requires proper survey design to collect the data you desire. Surveying students while they are in the space can provide rich data: students' thoughts, opinions, demographics, class standing, and more. This

process can be time- and labor-intensive, requiring developing and administering the survey, data entry and cleaning, and data analysis.

Interviews and Focus Groups

Interviews and focus groups allow you to gather information from a select group of students on their use of spaces in your library, as well as their ideas about those spaces. The benefits of interviews or focus groups is you can ask open-ended questions, probing questions, and follow-up questions to get a very complete story of your spaces. Downsides include the challenge of recruiting students to interview or participate in your focus groups, the necessity of transcribing the proceedings, and the complexity of coding, classifying, and analyzing the data you collect.

Benefits and Costs

The benefits of taking a deeper dive into the minds of your students include a rich understanding of how your students use the spaces. Surveying and interviewing students about their use of spaces helps you find out what they like, what they hate, and what they need, along with demographics about those who use your spaces. Downsides to these more complex methods are challenges in data collection, storage, cleanup, and analysis, as well as the possible need for IRB approval. The more complex data analysis might be beyond your staff's abilities. Time spent on the whole process is longer, so labor costs are higher. While you may not pay for the labor of your staff and faculty directly, there are opportunity costs to consider. When they are working on the assessment, they can't work on other projects.

Ultimately your goal is to learn three things about your existing library spaces: (1) what types of spaces you currently have, (2) how they are used, and (3) what types of spaces you need to support entrepreneurs.

MIND THE GAP ANALYZING WHAT SPACES YOU HAVE

Having completed your library's space assessment and compiled a list of spaces, you are ready to determine which spaces you need to add.

If your library has the six spaces helpful to entrepreneurs listed in [Table 1](#), your next steps are to make sure they are well used and well publicized to your entrepreneurial students. You might consider gathering information via sweeps to determine which spaces are under- or overused, then plan to expand those spaces overflowing with students. Promoting underused spaces to library visitors may boost the use of those areas.

If your library has gaps in the types of spaces, your next steps are to determine how to fit those into your building or even into areas adjacent to your library. Some types of spaces are challenging to add within existing buildings. The following sections offer suggestions on how you might add them to your library.

MAKERSPACES

Lego Buckets and Tables

Lotts brought making into her academic library on a shoestring budget by using Lego blocks (Lotts, 2015). She set out buckets of Legos on tables and encouraged creativity by having various contests and activities. These contests and events included Lego coloring contests, workshops, freshman events, and collaborations with Rutgers's Landscape Architecture department. Encouraging creativity and making in your library does not always require lasers and power tools. Bringing in opportunities for students to work with their hands to create things is important to their entrepreneurial experience.

Pop Up Creative Spaces

Think broadly in terms of experimenting, tinkering, and creating spaces. Cal Poly San Luis Obispo hosts a twice-a-month event, Watercolor Wednesday, where students can drop in and paint anything they want. The library supplies brushes, paints, water, and paper. This event, hosted by librarian Jesse Vestermark, encourages our STEM students to be creative in other ways. Although these creative spaces are not permanent, they can help students experiment, be creative, and explore different ideas. Other ideas for pop up creative spaces including making holiday cards and polynomiography, the art of creating polynomials (Lotts, 2015). University of San Diego's Geisel Library offers de-stress events with sandboxes of kinetic sand to play in, coloring books, and a crafts club (De-stress Activities, 2018).

OUTDOOR SPACES AND GREEN SPACES

Natural environments, particularly views of limitlessness and openness, stimulate creativity (McCoy & Evans, 2010). Plambech and van den Bosch's study of the impact of nature on creativity reports that natural environments are particularly helpful in the early stages of creativity: the preparation phase where people learn, research, and generate ideas, and the incubation phase, where people ruminate over the idea (Plambech & van den Bosch, 2015). Of the six spaces that foster entrepreneurs, natural and green spaces may be the hardest to add to an existing library. Our library has a lovely tree-filled garden with lots of seating and a mild and dry climate that allows for year-round use. But your library might not be equipped with a relaxing, nature-filled space. How can you bring a bit of nature to students who need green spaces to foster their entrepreneurial thoughts and behaviors?

One way is to bring some plants into your library. However, this isn't just a matter of bringing in a few plants and scattering them around the library. A number of large plants can be used to create "walls" and to give the impression of being outside. This has the added benefit of creating living collaboration rooms for your students.

Indoor fountains, while not cheap, can add natural sounds to your library. Water sounds combined with greenery can mimic nature and give your students the sense of being outdoors.

Living walls are indoor or outdoor walls covered with plants. They bring nature indoors and can improve the air quality of your library. The University of Maryland's McKeldin Library received a \$30,000 grant to build an internal living wall in their library. Other successful examples of living walls in academic libraries include Centennial College in Toronto, Mohawk College in Ontario, Canada, and the Harvard Graduate School of Education Library.

COLLABORATION SPACES

Collaboration spaces are spaces for two or more students to work on projects together. Collaboration spaces can also have three walls – a back wall for a whiteboard and two side walls – and open to a hallway. Collaboration spaces can have just one wall, a “back wall” for the whiteboard, with a table and chairs positioned under the whiteboard. These wall-less collaboration spaces are easily created on a long wall. Of course, these open collaboration spaces cannot be located in quiet zones. Collaboration spaces can be actual rooms with four walls, with one or more glass walls doubling as writeable space.

Alternatively, collaboration spaces are informally created using large rolling whiteboards to create temporary defined space for group work. Less expensive than floor-to-ceiling walls, collaboration spaces can be made using sofas with tall backs, configured in a square or horseshoe shape. Indoor potted plants can be used to wall off spaces for collaborations.

COMMUNAL TABLES

Communal tables, those which seat up to 20 students, can be readily added to large open spaces within a library. Smaller tables seating six students can be mixed in with other seating to allow for student interaction, collaboration, and networking. When placing communal tables in quiet study areas, it is helpful to restrict the size to seat four or fewer students, in order to keep the noise levels down when students work together in those spaces.

SOLO SPACES

Solo spaces for students are readily added through the use of specific types of furniture. Using carrel desks is an easy way to create isolated spaces for students to work alone. Solo desks along a wall encourage students to use the spaces by themselves. Long, shallow desks, located against a wall, are also an easy option for creating individual workspaces. In hallways and nooks, single chairs with a small table encourage solo studying. Pod-like or egg-like seating, which partially covers a student's head and body, is also an option to create solo study areas. This type of seating both dampens noise and restricts a student's peripheral vision to reduce movement distractions.

CASE STUDY

To test the process of assessing spaces and gap analysis, I studied another academic library.

This public research university is located on a 1,000-acre site with over 24,000 students. An eight-story library on campus serves the entire student population. There is also a small music library, located in a separate building, which was not examined.

The full analysis required three steps: examining floor plans, studying the library's web pages for descriptions of their spaces, and visiting the library to confirm existing spaces.

I examined the library's floor plans to determine which of the six types of spaces the library has available. However, the floor plans did not include the furniture in the spaces. Thus, the plans did not indicate how each area was designed to be used: by individuals or groups, quietly or noisily. Looking at the library's website, I found specific pages that mapped the locations of study spaces, group study areas, computer labs, and quiet study floors. These pages gave me a more detailed picture of the diverse spaces available to students. I followed up with a site visit to compare the floor plans and website with the actual space.

Collaboration Spaces

Well-designed collaboration spaces are mostly on the lower and noisier floors of the library, mostly on the first through fourth floors. The library offers four types of collaboration spaces: walled-in spaces; glassed-in collaboration rooms with whiteboards, designed for larger groups of up to 10 students; three-walled collaboration rooms; and "wall-less collaboration spaces." There are three-walled collaboration "rooms" which have a back wall for a whiteboard, two side walls for a bit of noise control, a couple of chairs and a desk, but no fourth wall. These three-walled collaboration spaces are located along a hallway. There are also a number of "wall-less" collaboration spaces. The most interesting of these spaces mimics a glassed-in collaboration space but with only one wall. These unusual collaboration spaces are located in an open, noisier area, on a long wall. Four large whiteboards are separated by a few feet. Below each whiteboard is a round table and four chairs.

Communal Tables

Communal tables are located in both the noisy and quiet study areas. The library offers a wide range of table types, ranging from 4-person tables to 10-person tables. In the quiet study area, the largest table seats six students, most likely to minimize noise from group work.

Computer Lab

Students can use the main computer lab in the Learning Commons on the second floor but can also find computers scattered throughout the lower levels.

Adjacent to the computer lab, students can collaborate using one of nine workstations connected to 32" 4K monitors. These workstations have a full suite of spatial, statistical, and media creation software.

Green Spaces

There are currently no green spaces within the library.

Makerspace

There are no makerspaces or spaces designed for creativity currently within the library.

Solo Space

Solo study spaces are located throughout the library, in both noisy and quiet study areas. Solo spaces come in a wide variety of forms, as determined by the furniture. Carrels are located throughout the library: in the microfiche and government documents area, along windows at the end of book stacks, and just outside the elevators in the lobby of each of the quiet study floors. One unique way of providing solo study areas, and to use wall and circulation space, is to place a shallow but long desk facing the wall, along with appropriately narrow chairs. In hallways, single high-backed chairs with desks allow for solo studying. In one interesting solo space, there are two “egg” chairs. These egg-shaped chairs block out about 270 degrees of noise and vision. When you sit in one of these chairs, it is much quieter, and your field of vision is narrowed so that you only see directly in front of you. Small footrests allow for a more relaxed posture.

ASSESSMENT OF SPACES

This library has well-designed spaces for fostering entrepreneurship. It currently has four out of the six spaces helpful for entrepreneurs (Table 2): collaboration spaces, communal tables, a computer lab, and solo spaces. There are currently no makerspaces or equivalents where students can experiment or tinker. This library also lacks any type of green space where students can reflect, relax, and restore themselves.

Table 2. Case Study Inventory of Spaces: February 10, 2018.

The Six Spaces	What They Have	What They Need
Collaboration space	X	
Communal tables	X	
Computer lab	X	
Green space		X
Makerspace		X
Solo space	X	

I scouted the exterior of the building to see if the library could incorporate or “borrow” outside spaces for students to use for reflection, relaxation, and restoration. An interesting form of concrete bench, incorporated directly onto the wall of the building, allows students to study outside but still use the library building. Directly outside the 24/7 study area are umbrella-covered metal tables, designed for either solo or collaboration work, usable throughout the year. Benches and other seating directly outside the library could be used by students for those activities.

RECOMMENDATIONS

The library could use two additional types of spaces to help foster innovation and creativity in their visitors: green spaces and a type of makerspace.

The library could add a green space in a few ways. One relatively cheap option is to add potted plants to the large covered balcony on the second floor. Two other uncovered balconies on the second and fourth floor could also add potted plants to provide students with a nature-filled break. Adding a living wall in the two-story entranceway would be a more expensive option to add nature to the building.

Adding a digital makerspace to the library would be an ideal and inexpensive way to add a space for creating within the library. A digital makerspace could fit into the microforms area, located on the noisier second floor, a short walk from the learning commons. The microforms could be moved to off-site storage.

CONCLUSION AND CALL TO ACTION

To foster entrepreneurs in your library, you must address the diverse needs of your students: to collaborate, to restore and relax, to quietly think and reflect, to experiment and tinker, and to be creative. Previous research has shown a number of spaces are conducive to creating student entrepreneurs (Bieraugel & Neill, 2017). Academic libraries should assess which of these spaces they have and which they are missing. In addition, it is important to promote your unique spaces so that students know what options they have when choosing where to go.

The easiest method to determine what spaces you have and what spaces you need is to study your floor plan and then walk through your library, taking photos of each of the spaces. Next, note potential spaces for adding in new spaces. The case study shows how easy it is to do that. The assessment and recommendations were completed in a day. By taking photos you see the spaces as they really are, not how you might remember them.

It is important to have all six spaces to foster your entrepreneurial students. Having these spaces allows your students to choose which spaces they need for the activity they need to complete. Do they need to collaborate loudly and work out details with their team? If so, have collaboration spaces and communal tables ready for them. Do they need to hunker down and think through their marketing and business plans by themselves? Have those quiet solo study spaces

or a computer lab available. When they need to be creative, to make and tinker, make sure you have a space for them to do so. Do they need a break, to restore and reflect? Have a green space ready for them. By creating new spaces in libraries, you engage students in new ways and help them to think differently and better.

REFERENCES

- Bieraugel, M., & Neill, S. (2017). Ascending Bloom's pyramid: Fostering student creativity and innovation in academic library spaces. *College & Research Libraries*, 78(1), 35–52.
- De-stress Activities. (2018, June 6). *The library UC San Diego*. Retrieved from <https://library.ucsd.edu/visit/de-stress.html>
- Ippoliti, C., Nykolaisyn, J., & German, J. L. (2017). What if the library... Engaging users to become partners in positive change and improve services in an academic library. *Public Services Quarterly*, 13(1). doi:10.1080/15228959.2016.1250694
- Linn, M. (2013). Seating sweeps: An innovative research method to learn about how our patrons use the library. In Dawn M. Mueller (Ed.), *ACRL 2013 Conference Proceedings* (pp. 511–17). Chicago: Association of College & Research Libraries. Retrieved from <http://www.ala.org/acrl/acrl/conferences/2013/papers>
- Lotts, M. (2015). Implementing a culture of creativity: Pop-up making spaces and participating events in academic libraries. *College & Research Libraries News*, 76(2), 72–75.
- McCoy, J., & Evans, G. W. (2010). The potential role of the physical environment in fostering creativity. *Creativity Research Journal*, 14(3–4). doi:10.1207/S15326934CRJ1434_11
- Nitecki, D. (2011). Space assessment as a venue for defining the academic library. *The Library Quarterly: Information, Community, Policy*, 81(1), 27–59. doi:10.1086/657446
- Plambech, T., & Van Den Bosch, C. C. K. (2015). The impact of nature on creativity: A study among Danish creative professionals. *Urban Forestry & Urban Greening*, 14(2), 255–263.
- Suma. (2014, July 5). *NCSU libraries*. Retrieved from <https://www.lib.ncsu.edu/projects/suma>
- Watson, L. (Ed.). (2013). *Better library and learning space: Projects, trends, ideas*. London: Facet Publishing.