Learning space attributes: reflections on academic library design and its use

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Even though students are not using the print collection, they still choose to go to the library for academic pursuits. The continuing preferences of students for library space can be examined in the light of a hierarchy of needs made up of layers of access and linkages, of uses and activities, of sociability, and of comfort and image. A space which combines attributes from all four levels is an ideal learning space.

Introduction

Outside the classroom, undergraduate students have a decided preference to use the library for their academic work (Applegate, 2009). At one time students had to go to the library to use the collection but since the late 1990s a critical mass of the library's collection has been made available online. Nearly ubiquitous Wi-Fi and mobile devices have made it easy to work on assignments, term papers, and theses anywhere but students are not abandoning the library for other locales. Students are choosing the physical library as much as ever and even in increasing numbers in renovated libraries (Shill & Tonner, 2003). Ethnographic and observational studies confirm that even though students are not using the print collection, they are, however, engaged in academic work when in the library (Bryant, Matthews & Walton, 2009; Demas, 2005; Foster, 2010; Foster & Gibbons, 2007; Suarez, 2007). What are the characteristics of the academic library, particularly the renovated library, that motivate today's millennial students to choose it as their preferred learning space?

Fred Kent, architect and founder of Project for Public Spaces (www.pps.org), says that even though people no longer need to go to the library to have their information needs met, they will go if a library is a "desirable place" (p. 72). Kent describes four characteristics which create desirability: access and linkages; uses and activities; sociability; and comfort and image (Kent & Myrick, 2003). Maslow's (1943) well known hierarchy of needs provides a framework to layer and consider these characteristics.

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Figure 1 superimposes Kent's terms on Maslow's framework and provides a schema which can be used by architects and librarians when considering the needs of today's library users in designing ideal libraries and learning spaces. The most basic characteristic is access and linkages at the bottom of the pyramid. Once this attribute meets the primary pragmatic needs of students, they will then look to see if the space also meets their ascending needs of varied learning and social activities. A learning space which not only has these attributes but also possesses the fourth and highest level attribute of comfort and feel will distinguish itself as an ideal learning space. We will describe how each level in this schema meets students' needs for academic and social space.
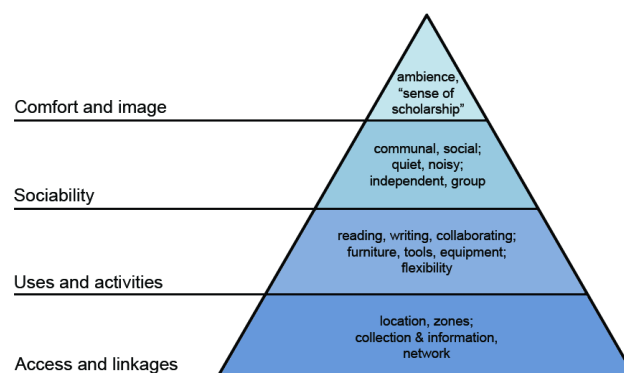

Figure 1. Hierarchy of learning space attributes.

Access and Linkage

The academic library typically occupies a central location on campus signifying its centrality to the university's mission of teaching and learning. Its location allows students to move to other campus spaces to attend classes, lectures, and labs, as well as engage in extra-curricular and social activities. This geographic placement addresses the physical aspect of access and linkage, the basic

characteristic which motivates students to utilize library learning spaces. Day-mapping exercises, photo diaries, and ethnographic interviews conducted by Foster and Gibbons (2007) at the University of Rochester and Delcore et al. (2009) at California State University, Fresno illustrate the densely scheduled and manifold activities students are engaged in daily. Many of these students "view the library as the 'center' of their day" (Foster & Gibbons, 2007, p.52).

The concept of access and linkage has implications within the physical library. Library learning spaces typically consist of sub-spaces or zones intended for different activities such as quiet study, group work, socializing, eating, mobile phone usage, and computer access. These zones can be delineated by permanent or moveable barriers, by design elements such as furniture or carpet coloration, or through mutually understood tacit behavioral agreements. Students indicate a strong desire to easily move from group to individual to media/computer lab spaces as they move through the activities and modes needed to conduct their research, writing, studying, and socializing in their highly scheduled and time constrained days (Delcore et al., 2009; Foster & Gibbons, 2007; Gfeller, Butterfield-Nagy & Grignon, 2011; Twait, 2009). Individuals in a quiet zone still like to be near friends working together in a group study space. When student input for library spaces is gathered, students often suggest individual or quiet spaces be located near group spaces, or at least on the same floor. Open sightlines for safety and wayfinding and jargon-free signage are also crucial.

Acker and Miller (2005) describe the value of learning spaces for contemporary students as "how effectively and efficiently the space provides access to learning resources. These resources include other students, access to information technologies and Web content, and flexible student and faculty space configurations that support efficient learning" (p. 3). Empirical evidence that the library provides such valuable space can be seen in Suarez's (2007) conclusions after observing students in the library were actively engaged in "reading, writing, consulting with fellow students, using computers to do literature searching, communicating with others, and writing assignments" (Conclusions section, para. 6).

Access and linkage ties in well with the library's traditional mission of providing patrons access to recorded knowledge. Students not only access the library's collection, both print and online, but also collections and information resources from other universities and research centers through network access and inter-library loan. The concept of linking to the collection also has a psychological aspect to it eloquently presented by Foster (2010) when describing science students' preference for being in the science library at the University of Rochester and their expressed desire to be surrounded by the body of knowledge and achievement from their chosen field. Space was important to how the students represented themselves as scientists. Even though today's students may not be as engaged with the print collection to the degree of previous generations of young scholars, they still have a need for subliminal linkage to the physical collection and the tradition of scholarship.

Uses and activities

Several ethnographic studies in academic libraries in Canada, the United Kingdom, and the United States have shown that students are engaged in academic work the majority of the time they are in the library and participating to a lesser degree in social behaviors. Occasionally, some of these social and leisure activities occur simultaneously while students are engaged in academic activities. The millennial generation is known for its ability to multi-task. (Bryant et al., 2009; Delcore et al., 2009; Foster & Gibbons, 2007; Suarez, 2007). Students often spend many hours within the library and therefore need a place that is welcoming, comfortable, and can meet their many needs as they arise. Applegate (2009) states that "an effective library is one that addresses the entire spectrum of student needs, [and] does so as part of the entire student space-use ecology on a campus" (p. 345).

Consistent themes emerge from visioning exercises, design charrettes, and interior design workshops conducted at various universities to gather student input on "ideal" library space. Students have a myriad of activities they conduct during the process of writing papers and assignments and these require different spaces, furniture, and tools (Delcore et al., 2009; Foster & Gibbons, 2007; Twait, 2009). They require comfortable seating, large tables, photocopiers, whiteboards, office supplies, and computers, scanners, and printers in spite of the large percentage who have personal computing devices (Foster, 2010; Foster & Gibbons, 2007). Successful learning spaces supply furniture and equipment to meet student needs.

Today's pedagogy emphasizes group and collaborative work. A major trend in library renovation is to increase the amount of group study space to accommodate this practice (Bennett, 2003; Shill & Tonner, 2003; University Leadership Council, 2011). Increasing group spaces should not be at the expense of quiet spaces, however. Students consistently design ideal spaces with quiet areas and indicate noise dampening features. The desire for quiet, contemplative study is as strong as ever and a common student complaint often involves the lack of quiet space within the library (Suarez, 2007).

A growing trend in library renovations and new construction has been to create a one-stop facility for student needs by incorporating non-traditional units such as cafés, writing centers, classrooms, museums, student services centers, and other types of units, both academic and non-academic, into the library (Shill & Tonner, 2003; University Leadership Council, 2011). While the impact of these other units is outside the scope of this article, it is interesting to note that Shill and Tonner (2004) found, with the exception of writing labs and art galleries, the inclusion of facilities such as classrooms, computer labs, and cafés did not significantly increase traffic to the library and concluded "there is no evidence that the presence of particular nonlibrary facilities has a significant impact on library exit counts" (p. 143).

Another trend in next generation library space planning combines flexibility and modularity (Acker & Miller, 2005; Freeman, 2005; University Leadership Council, 2011). Patrons should be able to reconfigure the space quickly to meet their just-in-time needs. Foster and Gibbons (2007) referred to this as "rebootable" since students can temporarily customize the space as needs arise and this space can then be quickly reorganized to accommodate the next group of students (p. 25). This will ensure the library can continue to meet the changing and future uses and activities of its students and faculty.

Sociability

Going to the library to study and work, instead of remaining in the comfort of home, is a choice for interaction and inclusion. Whether engaging with the literature or intent upon independent or group work within the library, one is choosing a social space and social activity. The internet encourages isolation, yet Google Scholar's motto "stand on the shoulders of giants" acknowledges the interconnectedness of knowledge creation with sociability.

Gayton (2008) describes the "communal library" of quiet contemplative independent study and the "social library" of collaborative group work and conversation. Both aspects require different spaces and design and both are equally important learning spaces in today's library (p. 60). Communal carrel spaces are usually in areas designated as quiet while group study rooms are in noisier social areas. However, these areas are not mutually exclusive: Applegate (2009) discovered that group study rooms are also popular for individual study; Bryant, Matthews, and Walton (2009) observed during their ethnographic study of an open library space primarily intended for groups that a high number of students used the area for independent study. Different students have different requirements for quiet, privacy, and social inclusion. There is no "ideal"

learning space with regards to level of sociability; both communal and social spaces are required.

The traditional reading room is a hallmark of the academic library and remains one of the most popular campus learning spaces. Spaces that manifest tradition, in such things as long wooden tables and decorative task lighting, enforce quiet traditional work (Foster, 2010). Demas (2005) describes the motivation to choose "the unique pleasure of being alone, in a quiet place, while simultaneously being in a public place associated with scholarship... it is a place to see and be seen while working privately" (p. 29). Similarly Freeman (2005) states "a significant majority of students still considers the traditional reading room their favorite area of the library" (p. 6) and Gayton (2008) concludes the value of libraries lies in these communal spaces which support and enhance serious study.

The need to see others and be seen is primal to human nature and a strong motivating force to choose a library learning space. Students want to be near their friends, even if their friends use a different sub-space or zone. Students want to build relationships with other students and the library is the ideal place where they can see each other, meet, and form connections. Building relationships with librarians whom students may recognize from an in class lecture, or else from seeing on a regular basis within the library is another important element in social partnerships and academic success. Some libraries also provide office space for faculty members and graduate students, adding to the sociable environment.

Comfort and image

Comfort and image is the highest order attribute in our schema and the most difficult to define. It is the most crucial attribute with regards to imbuing motivation in students to use library space and maintain usage into the future. Demas and Scherer (2002) refer to this as "esprit de place" where space, architecture, furnishings, décor, and integration into the community's needs and ethos combine to create a transcendent space (p. 65). Many articles, reports, and books have been written about "library as place" and how traditional libraries are viewed as sacred, timeless, classic, high-road, awe-inspiring, and other similar adjectives (Buschman & Leckie, 2007; Demas & Scherer, 2002; Freeman, 2005; Jackson & Hahn, 2011; Loder, 2010). Even though this intangible aspect is difficult to quantify and qualify, it has a solid impact upon library usage. Shill and Tonner (2003) reported "overall ambience" rated as excellent increased from 2.5% in pre-renovation to 70.4% post renovation for the libraries they surveyed. Clearly a significant effort had been put into creating a

more welcoming and pleasant environment. In their analysis of library usage patterns, Shill and Tonner (2004) determined a similar strong positive correlation between quality of overall ambience and usage of the library and found that "quality of user work space" and "quality of layout" were very strong predictors of increased usage of the library whereas simply increasing the number of group study rooms did not lead to increased usage. Many articles have been written about the sense of scholarship and connection to higher principles felt in a traditional library. Freeman (2005) writes

upon entering the library, the student becomes part of a larger community – a community that endows one with a greater sense of self and higher purpose. Students inform us that they want their library to 'feel bigger than they are.' They want to be part of the richness of the tradition of scholarship as well as its expectation of the future. They want to experience a sense of inspiration. (p. 6)

When Twait (2009) conducted a design course with students, they created a library with a grand entrance in order to signify its importance as a place of higher learning and to inspire pride in students and their college. Antell and Engel (2006) and Jackson and Hahn (2011) describe traditional library architecture, design, and spaces and the effect these features have upon people, especially their striving for academic achievement. Tony Hiss (1991) describes "simultaneous perception" which is our awareness and experience of the character, essence, resonance, charm, and aura of the place around us and the profound impact this has upon us as we go about our work or activities (p. 3). Traditional library spaces, through affective resonance or simultaneous perception or some other means, are able to harmonize the student experience with the principles and goals of higher education.

When student input is gathered in exercises to design their ideal library, a consistent element has been a preference for a comfortable and "scholarly" atmosphere. Students choose mahogany furniture, old style lamps, fireplaces, and nice carpets (Delcore et al., 2009; Foster & Gibbons, 2007; Gfeller, et al., 2011; Twait, 2009). Research conducted by Jackson and Hahn (2011) in which students were shown images of both traditional and modern library interiors, exteriors, and objects, students overwhelmingly preferred the images classed as traditional and reported "an increased desire to use the materials in the traditional library and the library space itself" (p. 435). They also chose images of traditional libraries as better supporting the university's motto or mission statement. Students clearly desire modern technology embedded in traditional spaces.

Another recurring element that emerged from student input and design exercises is the desire for natural light (Delcore, et al., 2009; Foster & Gibbons, 2007; Gfeller et al., 2011; Twait, 2009). Student preference is for abundant natural light with a decided aversion to fluorescent lighting. As a result of a charrette design exercise conducted at the University of Rochester, floor-to-ceiling windows were incorporated into the design of a renovated library and the furniture layout was changed to place tables for group work by these windows. Students reasoned they would be spending the majority of their time engaged in group work and thus wanted to be situated in the prime real estate window area (Foster & Gibbons, 2007). Kilic and Hasirci (2011) concluded daylight has a strong effect upon patron preference and satisfaction with using the library. Shill and Tonner (2004) confirm that natural light was one of the strongest determining factors with regards to post-renovation library usage. When Loder (2010) visited new or newly renovated university libraries to determine how they are tackling energy needs, what struck him most was the trend towards abundant natural light which resulted in a warm and friendly atmosphere. Loder writes "the most noticeable overall characteristic of all these libraries were their attention to enhanced personal patron comfort, including lots of varied seating, softer natural light, wide tables near windows, and user-controlled task lighting" (p. 353). Sunlight, a free and abundant natural resource, has a powerful effect upon creating a comfortable and usable learning space.

The display of artwork is not only an important feature consistently mentioned in student feedback but also a current design trend and artwork created by or depicting the university community is particularly valued (Delcore et al., 2009; Demas, 2005; Gfeller et al., 2011; Loder, 2010). This should not be considered a frivolity. During our library's renovations a prominent work of art had to be temporarily removed for safety resulting in howls of protest, even letters, from library patrons; library administration was forced by popular demand to guarantee the picture would be returned after renovations.

Conclusion

The science library we work in has undergone staged renovations for the past decade culminating in the restoration of a large, dark, and uninviting reading room, seldom used by anyone, back to its sunlit Victorian grandeur, now often filled to capacity. We have seen first-hand how the different stages of renovation have correlated with Kent's characteristics of desirability as depicted in our schema. Constructed in 1892, renovations have addressed current pedagogy and added technological features in a traditional library creating a campus destination used by all levels of students in all disciplines.

The future of academic libraries does look promising. Antell and Engell (2007) discovered that younger scholars are more passionate supporters of the physical library than older scholars. They concluded

perhaps it is because younger scholars came of age in the Internet era that they so appreciate the physical surroundings of the library: because they have not had to use the library materials as intensively as previous generations of scholars, perhaps they have learned to seek out the library space to find the very qualities that the electronic experience lacks: a sense of sanctuary, an intellectual state of mind, [and] a "spiritual sensation of knowledge"...(p. 176)

Other campus spaces may meet some requirements such as Wi-Fi, comfortable seating, large tables or accommodations for groups and conversation, but few also combine the communal, contemplative, and scholarly atmosphere.

The library has always been more than a warehouse for recorded knowledge. It provides a place for contemplation, integration, and creation of new ideas or knowledge. A well designed academic library that encompasses all of Kent's requirements for desirability can truly become a transcendent learning space.

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