# Universal Design

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*A practical guide to creating and recreating interiors of academic libraries for teaching, learning and research*

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# List of figures

# Acknowledgments

This book is for all librarians, library staff and others who have a deep passion for the role of libraries on college and university campuses. Specifically, I would like to acknowledge those institutions that provided me the opportunity to design and develop meaningful learning spaces including Clinton Community College, Niagara County Community College, and the Western New York Library Resources Council – all located in New York State. To the libraries and iCommons at the University of Chicago Loyola, Loyola Marymount University, Ohio State University, University of Michigan, Abilene Christian University, University of Virginia, and Loughborough University located in the UK – you need to be recognized for your forward-thinking design and risk taking in creating effective spaces for research, study and learning. To Anne Taylor, Professor of Architecture and Planning at the University of New Mexico: Your work on creating learning spaces that inspire is amazing and provides a refreshing look at the impact Universal Design has on teaching and learning. We can all learn from your expertise.

And, to everyone I have talked to, everyone I have read, and every library I have visited – a list much too long to be comprehensive – this book is for you.

# Preface

The purpose of this text is to provide practical, up-to-date information on how to create user-centered spaces for students and faculty within academic libraries. Options for designing universally-friendly spaces are based on applied research and best practices. Issues addressed include looking at factors that impact renovation and construction of new space, identifying potential partners, elements of effective interior design, and practical advice on plan development and implementation. The text draws from the author's 25+ years experience in academic libraries. Seminal studies and related research are referenced throughout. A comprehensive bibliography of all resources used in the writing of this book is included after the last chapter.

Libraries of all types (school, public and academic) in the USA and elsewhere have been experiencing a surge of use (American Library Association, 2011). Academic libraries, specifically, are also increasingly being used by students, faculty, researchers and scholars (Shill and Tonner, 2004). Research shows that use of a library increases dramatically when new libraries are constructed and/or library buildings are renovated.

The purpose of this book is not to argue whether or not the physical library is needed in today's society. For this author, the dramatic increase in the number of individuals and groups who use libraries gives us the answer – yes, we

need libraries, and yes, the building itself needs to meet the current and future needs of people throughout their lives.

This book seeks to provide the reader with best practices and guidelines on how to create user-centered spaces for students and faculty within academic research libraries. Facility issues to consider when renovating or building new; identifying potential collaborators in the use of library space; considerations for designing interior spaces for various functions; and practical advice for creating and implementing your plan are offered. Although not intended to be a comprehensive text on academic library design, renovation and construction, this book will provide you with basic, sound advice. References to comprehensive and/ or important studies and related information on specific topics are provided throughout the text, with a comprehensive bibliography of sources used in researching this book printed after the last chapter, should the reader wish to delve into a topic more deeply.

This text is written from the perspective of someone who has worked in various positions within different types of academic libraries over the past 25 years. As such, out of these pages emerge the author's experience and education in library renovation, including the design and construction of computer labs, information literacy classrooms, complete interior design and renovation of a community college library, office complex design including a training center for a nonprofit multi-type library consortium, a library café, writing center, testing center, a center for teaching excellence, and flexible study and learning spaces for students in a large academic research library.

The author is currently working on designing, planning and renovating a medical research library and a 200 000+ square-foot multi-use academic library at a major research university. The latter project includes the development of an

information commons, group and individual study and research areas, as well as a climate-controlled, easily-accessible special collections department.

Directors, deans and other administrators and leaders of academic libraries will find this book especially useful. Practicing librarians, graduate students in library and information studies/science programs, academic affairs administrators, and those involved with writing centers, centers for teaching excellence, information technologists, interior designers and architects of library buildings will also find the information and practical advice within these pages helpful.

The book starts with a chapter explaining why interior design matters when creating library spaces. Chapter 2 focuses on the practicalities involved in developing effective user-centered areas. Designing user-friendly spaces within the context of construction standards and the important elements of interior spaces, such as color, flooring, furnishings, lighting, security and other elements are presented in Chapter 3. The concept of "Universal Design" of learning spaces is explored in Chapter 4. Chapter 5 pulls together the various design considerations discussed in this book into a framework for creating user-friendly learning environments via Universal Design in academic libraries. One of the best ways to learn is through reading about others' experiences. Chapter 6 offers various real-world scenarios where the principles of Universal Design are applied to make spaces within academic libraries conducive to the information needs of today's students and scholars. Chapter 7 provides a review of the challenges evident when trying to meet the needs of faculty and students. In addition, a number of trends impacting academic library design are given. Effective planning strategies are described and the continued relevance of libraries in academe today and into the future is explained.

For the seriously time-pressed reader, a list of key "take aways" from the book is provided. Current references to relevant information appear throughout the text.

Several features of this text distinguish it from other books on the market. This book provides practical advice that can be applied immediately. Explanations and information are brief and to-the-point to meet the needs of the time-crunched reader. The information is current as of the time the book was written. In addition, easy-to-locate references are provided for the reader who seeks additional information.

If you have picked up this book, you are most likely exploring the possibility of academic library renovation or building a new library, or you are at the early to middle stages of your project. It is hoped that this work will help you and your design team create the best academic library space possible.

# About the author

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# Why interior design matters

**Abstract:** This chapter discusses why interior design matters in academic libraries. It provides a summary of relevant research and current thinking in academic library design. Research cited includes the literature on work environments and productivity, the influence of acoustic and visual aesthetics on productivity and life work, the role of neuroscience in creativity, relaxation and alertness, current studies on the effect of interior design of school buildings on teaching and learning, and the impact of interior space design on library employees. The definition and importance of Universal Design, examples of Universal Design principles, and designing effective spaces for today's students and faculty, as well as current thinking in academic library design are explained.

**Key words:** academic library design, interior design, learning styles, service-oriented design

## Introduction

Spaces where we work, play, contemplate and interact in a variety of activities – both as individuals and in groups – are designed, or should be designed, to enhance our experiences in that space. Think about the spaces you visit. Museum space is usually large, open and uncluttered – inviting you to explore exhibit pieces in an unfettered environment. Café space is almost always close and cozy – with the aromas

of coffee and bakery treats – inviting intimate conversation. Children's spaces are colorful with smaller, comfortable furniture scattered about soft carpeting, thus inviting you to learn, listen and play. These spaces all have form and function – they are more often than not unifunctional. Academic research libraries, in comparison, are traditionally large, sometimes over-powering structures originally designed to house print materials, but now in need of renovation – and sometimes rebuilding – to meet the multifunctional demands of a new generation of students and scholars.

## The importance of interior design

So why is it so important to pay close attention to the interior design of academic research libraries? A look to the literature on environment and productivity may provide some initial answers. One of the most expansive studies on this topic was the Buffalo Organization for Social and Technological Innovation study conducted in 1984 (Brill, Margulis and Konar, 1984). More than 10 000 workers over a period of four years revealed that aesthetics, noise level, lighting, privacy and comfort all contribute to the level of job satisfaction and performance. An interesting finding was that employee involvement in work space design occurred with only 25 percent of study participants, even though worker participation in design significantly contributed to higher ratings across the board in measures of job performance and environmental and job satisfaction.

Other studies support this research. Davies (2005) found that acoustic (noise level) and visual aesthetics in the workplace influence productivity and life outlook. Both elements were found to impact employee engagement in work regardless of the type of workspace. Schwede, Davies

and Purdy (2008) discovered that effective workspace design requires employee input throughout the design process, whether it is renovation or new construction.

Experts in neuroscience have also begun exploring the impact space design may have on such mental activities as creativity as well as physical responses such as relaxation and alertness (Anthes, 2009). Results of this research are being implemented into design. For example, The Lodge at Broadmead, located in Victoria, British Columbia, Canada, was constructed to reduce noise levels, and the interior designed to be less clinical and more home-like. Anecdotal evidence indicates that residents of this facility are calmer and less agitated (Gnaedinger et al., 2007).

Research into the interior design of school buildings has had similar outcomes. In his study of elementary and secondary schools in the UK, Edwards (2006) found that students in schools designed to allow for maximum daylight as well as incorporating natural ventilation had higher rates of student performance. Observations as well as other qualitative and quantitative data analyzed in this study indicate that the level of classroom design quality may play a key role in reducing teacher stress and absenteeism, leading to improved professional performance. Additionally, study participants responded that effective learning space design tells people that the community greatly values education. Edwards offers several effective design strategies including maximizing daylight in learning spaces, keeping the interior temperature comfortable and noise levels to a minimum, and making use of secondary areas, such as alcoves and other recessed openings, for informal learning. Research in the area of environmental psychology as it relates to the design of schools is in its infancy (Edgerton, McKechnie and Dunleavy, 2005). As Judson (2006) explains, "Processes of teaching and learning are inescapably situated. It is time we

examined curriculum within the interconnected web of social, cultural, political, and ecological contexts in which we teach and learn."

Research into the area of the impact that interior space design has on librarians and library workers has uncovered parallel results (Staines, 2009). Survey responses from academic research library leaders located in the USA, Canada and other countries were consistent in regards to ideal meeting space. Good lighting, flexible space, technology-rich, conveniently located refreshment facilities, moveable tables and chairs, fresh air, windows, and residing in an easy-accessible location that was quiet, clean and comfortable were characteristics provided by the survey group. It is interesting to note that just over 50 percent of the study participants held meetings in less than ideal spaces – spaces that had not been renovated or refreshed in many years.

## What is Universal Design?

Universal Design is not a new concept, but is becoming increasingly popular in most situations where design is required. From developing user-friendly kitchen tools and appliances to designing flexible furnishings for use in home, office and library, Universal Design seems to be the way of designing for our work and leisure lives today and tomorrow. Its beginnings and constant evaluation are interesting and can be inspiring for the development of library spaces for students, faculty and staff.

### *The beginnings of Universal Design*

Universal Design has its roots in the immediate post Second World War era when disabled war veterans were returning

home to the USA, only to discover challenges in using products and moving in, out and through buildings and other structures. For example, door knobs were not designed for use by someone whose hands lacked normal mobility, stairs became barriers to the physically challenged as walking ramps were not required in building design, and the only assistive technology for reading text was the magnifying glass. Two inventors – Thomas Lamb and Marc Harrison – identified these and other related issues, and subsequently spent most of their lives developing products and buildings that could be used, universally – that is by almost anyone – regardless of their mental or physical challenges.

Born in New York in 1896, Thomas Lamb was both a children's book illustrator and textile designer. Inspired to help injured veterans of the Second World War, Lamb redesigned crutches that were more easily used and more comfortable than previous designs (Hagley Museum and Library, 2011). Lamb eventually became known as "the Handle Man" after he patented a handle that could be universally applied to cutlery, surgical instruments, dental tools, luggage, as well as sports equipment. His invention was used in products developed by the Aluminum Cooking Utensil Company, the maker of Wear-Ever cookware and Cutco Cutlery (Hagley Museum and Library, 2011).

Industrial designer Marc Harrison, born on July 1, 1936, also in New York, was compelled into this field after experiencing a severe head injury during a sledding accident when he was 11 years old. Unable to walk or talk, Harrison had to relearn these basic skills to survive and function. He went on to complete a bachelor's degree in fine arts in industrial design in 1958 from the Pratt Institute and a master's degree in fine arts from the Cranbrook Academy of Art in 1959. Most of his career was spent as a professor at the Rhode Island School of Design where he became a leader

in the fields of ergonomics, physical and rehabilitative medicine, and adaptive products, as well as serving as principal of his own consulting firm, Marc Harrison Associates, during the 1960s (Hagley Museum and Library, 2011).

Products and physical structures were designed for the "average" person up until the Second World War. Challenging this monolithic design thinking, Harrison focused his research on designing products and environments that could be used by everyone, regardless of their physical or mental capabilities. Harrison is most well known for creating the Red Cross Mobile Collection System as well as the award-winning design for the high-selling Cuisinart food processor (Hagley Museum and Library, 2011). His design style and ethic led him to partner with the International Lead Zinc Research Organization to create the ILZRO House. The ILZRO (Industrialized Housing System) was built in Foster, Rhode Island starting in 1971. The project, which ran for five years, involved trying new materials and energy conservation strategies as well as implementing products that addressed the physical needs of individuals. The results included the installation of sinks at lower heights, light switches that could be turned on-and-off by a push of a hand, and appropriate kitchen work surfaces for the wheelchair-bound (Hagley Museum and Library, 2011). The ILZRO is known as a pioneering Universal Design project. Harrison passed away in 1998 while working on the concept of the "universal kitchen."

More recently, one can look to Steve Jobs (1955–2011), co-founder of Apple, Inc., developer of the iPod, iPhone and iPad, and a leader, mover and shaker in the world of Universal Design. Jobs' creativity and ingenuity have resulted in the development of intuitive products that are easy for almost anyone to use. In terms of product design, Apple's goal is always to invent technologies that can be seamlessly

integrated into people's lives. Instead of forcing the user to use one type of technology to access information, another version to edit the information and still another iteration to share information, Jobs' products make it possible to complete tasks without jumping through various intentionally-designed product "hoops." A significant bonus with his inventions is not only that they work exceptionally well, but that they also look good. His Universal Design aesthetic was so strong that it has carried over to and is recognized by the art world (Appleinsider, 2011).

## Universal Design defined

Today's concept of "Universal Design means that rather than designing your facilities and services for the average user, you design them for people with a broad range of abilities [and specific human] characteristics – such as age, reading ability, learning style, language, culture, and others" (University of Washington, 2008). Thus, the design of a specific space is driven by the overall concept of creating an area that can be used by as many different types of people, who have varying characteristics, as possible. According to the Institute for Human Centered Design, "Universal Design is an orientation to design in which designers strive to incorporate features that make each design more universally usable" (Institute for Human Centered Design, n.d.).

Following from the definition of Universal Design are the various principles which guide its use and implementation (Center for Universal Design, 1997). Experts in the fields of architecture, product development, design engineers, and those with an interest in environmental or "green" design worked together to develop the Seven Principles of Universal Design. Concisely speaking, these include:

- designing products, spaces and buildings that can be used by as many different individuals, with varying degrees of physical and mental challenges, as possible;

- designing-in flexibility of choice (e.g. right and left-handedness);

- creating designs that can be easily understood, with little effort on the part of the individual;

- developing designs that communicate information effectively;

- minimizing the possibility of accidents through careful design;

- making sure that the design can be used by anyone with minimal physical and mental effort;

- providing optimal size and space within the design so that it can be navigated by people of all sizes and abilities.

Meeting all or most of the Seven Principles of Universal Design can be daunting. However, with thought and some research, creativity and a willingness to work through various design concepts, spaces can be developed that meet the design principles. A few examples are provided for illustrative purposes below.

## Example of Principle 1

Consciously designing spaces that can be easily used by as many different people of all types as possible is Principle 1. This principle can be applied to almost every component of library design. A door that can be opened automatically by the push of a button so a wheelchair can maneuver through it is a good example of Principle 1 in practice.

## Example of Principle 2

Designing-in flexibility of choice – Principle 2 – addresses the various needs of how people effectively use the space. Elevators are a prime example of this principle as most allow the individual to select which floor to go to in a building. Floor buttons are accessible from both seating and standing positions, they are embossed with a number, and the appropriate Braille configuration is posted next to each number. More modern elevators announce floor locations through using digital voice technology.

## Example of Principles 3 and 4

Creating designs that can be easily understood, with little or no effort on the part of the individual (Principle 3) and developing a design that communicates information effectively and easily (Principle 4) can be challenging as librarians tend to post numerous signs in dense text throughout their libraries. Instead of a sign saying "Stairs this way," a sign with a graphic of someone walking up the stairs would better meet the intent of Principles 3 and 4.

## Example of Principle 5

Minimizing the possibility of accidents through careful design – Principle 5 – is critical in making sure that entrances, exits, spaces and other way-finding areas are easily and safely accessible and usable. The use of handrails, ramps, automatic doors, flexible furniture and so on greatly reduces the chance of an accident, and also provides a barrier-free environment that can be easily negotiated.

## Example of Principle 6

This leads to Principle 6 – creating a design that can be used by anyone with minimum physical and mental effort. Easy navigable floors – ones without thresholds or other obstacles, such as cabling or in-floor electrical outlets – greatly assist physically challenged individuals to move freely throughout the library. This also eliminates the issue of staff having to push and/or lift full book carts over thresholds.

## Example of Principle 7

Let us consider how people enter and exit a library through its main designated entryway. Following the principles of Universal Design, the goal in creating walkways, hallways and related passageways is to make sure that they are easily navigated. In other words, we want to create as barrier-free a transition area as possible. Here is an example of a library entrance that does *not* meet the elements of Principle 7, as well as solutions that address access issues:

> A crowded entryway made so by too many service points and not enough room for people to step into the building and quickly survey their options. Universal Design would rectify this design by creating an entryway that encourages people not only to enter the library, but entices them to move farther into the building to see what else is available. Landscaping and signage would be well-maintained and clear, respectively. There would be unfettered site lines from the entranceway to primary service and use points. Essentially, upon entering the library, one can easily understand the layout of the building.

The principles of Universal Design are applicable to the design of today's academic libraries. Having grown out of the notion

of barrier-free design and the extensive body of historical and current research and implementation of products that meet physically and mentally challenged individuals, Universal Design is the framework that enables us to create, design and build spaces that are easily usable by all. "Internal consistency [of Universal Design] cultivates trust with people; it is an indicator that a system has been designed, and not cobbled together" (Lidwell, Holden and Butler, 2003).

# Designing for today's users

Users of academic research libraries are primarily students – undergraduate, graduate and professional – and faculty who teach and conduct research within and across all disciplines. Students and faculty are both full-time as well as part-time, and are on-campus or use the library remotely, 24 hours a day, 7 days a week. Academic research libraries are also used, albeit to a lesser degree than faculty and students, by staff, visiting scholars, alumni, administrators and other visitors to campus. Each individual uses information resources and library services in different ways and for various lengths of time. Some are more adept than others at using new information technologies, such as smartphones and iPads. In addition, users will take advantage of some services and spaces and not others. Therefore, Universal Design is a natural fit to meet the variety of abilities, education and experiences of today's "academic." That said, the two groups that use the library most frequently—students and faculty – are worth exploring a little deeper.

## *Today's students*

Our world has become complex and chaotic. Today's student lives in a world where they most likely will have more than

one career in their lifetime. To be successful, the next generation of leaders and workers will need to know how to search for, locate and analyze information effectively, then be able to apply known information to work and life decisions and situations that involve problem solving as well as to create new knowledge. We know that information about new technologies doubles every two years and that 92 percent of this information is not stored on personal computers, but on servers located on or off-campus (Wan and Gut, 2011). Where once finding information was quite linear – searching the card catalog led you to books in the collection – the increasing numbers of information channels (e.g. the internet, television, radio, etc.) require one to be very skillful at knowing where to look for information, how to locate it, and to determine its usefulness to the topic at hand. Our role as librarians, in this regard, has not changed. The need for librarians to guide users to the information they want and need is probably more pressing than any other time in history.

Multiple paths to information is only one segment of our lives impacting the way we live, learn and work. Kay and Greenhill (2011) have identified several other trends that, together, provide a context for the complex and chaotic world we find ourselves in:

- globally, economies are increasingly being driven by information, knowledge and innovation;

- competition and the need and expectation for continuous assessment and change is intense;

- more opportunities exist today than at any time in history, and the situation is accompanied by increasing levels of risk.

Today, the world's population is more dynamic than ever, resulting in diverse communities and places of work.

Diversity is found in age, race, sex, ethnicity and sexual orientation. The reliance on collaboration and communication, especially social networking, is prevalent throughout society. This diversity, complexity and chaos directly impacts all of us, especial students. "Today's students are masters at multitasking. A typical worker in the knowledge economy juggles 200 emails, multiple instant messages, several phone calls and numerous text messages on any given day" (Gut, 2011). It is not only important to understand the world in which students find themselves, but also to explore in greater depth how today's students find the information that they need.

## *The student experience*

Probably the most well known study of the information discovery skills of college students was conducted by librarian Susan Gibbons and anthropologist Nancy Fried Foster at the University of Rochester (Gibbons and Foster, 2007). This study was groundbreaking in that it took an anthropological view of how students search for, locate and analyze information for their course assignments within the broader context of their everyday lives. Students kept map "diaries" illustrating their movements throughout the day. Researchers also observed students working on their assignments including how they went about seeking the information that they needed. The study found that students tend to multitask – it is an integral part of how they work and learn, and may actually make them think differently from previous generations (George, 2007). Another important finding is that students do not start and finish research assignments in a single sitting. Rather, they tend to allocate chunks of time during the semester. Additionally, when uninterrupted time is needed to read, study or write,

students use the library without bringing a laptop or other electronic device that might distract them.

A more recent ethnographic study of college and university students and academic libraries is the Ethnographic Research in Illinois Academic Libraries (ERIAL) Project, conducted by Asher and Duke (2010), which focused on how students search for information. This study found that students preferred to use basic Google-type searches; did not delineate one type of electronic resource from another in terms of the scope of the source; failed to refine information searches by using advanced search techniques such as Boolean operators (AND, OR, NOT) or limiting by date or format; and tended to change their research topic if they were unable to locate relevant and/or enough information for their originally selected topic, quickly. Also of interest, especially when designing user-friendly spaces in academic libraries, is that the students did not see the relevance of asking a librarian for assistance. In fact, not one student sampled in this study reported having sought help from a librarian.

Part of the answer to why students multitask, get frustrated when not immediately gratified, and feel more confident with their information-searching skills than they really should be, might be found in the generation from which they came. From the US perspective, there are five "generations" (George, 2007): those born during the Second World War, in between the Second World War and the Baby Boom, the Baby Boomers themselves, Generation X, and the Millennials (also referred to as Generation Y). Characteristics that are identified with each generation provide us with a context within which to understand each generation's way of thinking about and working in today's world.

Almost all individuals who lived during the Second World War were impacted by this significant event either indirectly or directly. This generation, frequently referred to as

"the Greatest Generation," tend to value teamwork and the sense of community that can bring forth good in the world. Those living between the Greatest Generation and the Baby Boomers are known as the Silent Generation. The great upheaval of the Second World War led to a period of calm, quiet and prosperity for this group. The counterculture movement emerged in the early 1960s. Known as the Baby Boomers or the Boomer Generation, this cohort of Americans were anti-establishment and anti-government, and sought to create a society with greater freedom from rules and regulations. Many librarians working now tend to be from this era. The Baby Boomers were followed by Generation X or Gen X, who cover the period from the mid-1960s through the 1970s. This is the first generation in the USA to have computers. Generation Y, also known as Millennials, are those born from 1980 to 2000 and are the children of the Boomers. Boomer children, for the most part, have not experienced life without the internet. Google, barcodes, smartphones, GPS and social networking are so embedded in the fabric of their lives that it is challenging for Millennials to even imagine a time without new technologies significantly impacting their communication, information-gathering and social connectivity.

Millennials and the emerging next generation – whatever moniker will be attached to them – are the college students of today and tomorrow. With technology so ingrained into their daily lives, Millennials have become quite adept at multitasking. Some argue that multitasking may make them think differently from previous generations (George, 2007). What is known from the Foster and Gibbons study is that today's college and university students work on course assignments, including research papers and projects, "in spurts" over time (Gibbons and Foster, 2007). Such work time is purposefully done in a place without distractions; in

this case in the library. In addition, blocks of uninterrupted time are carved out of a very busy life. Today's students are always on the go – from early morning to late at night. Students who participated in the University of Rochester's ethnographic study indicated that they eat when and where they can, keep track of their schedules online or in print, and frequently use the library late at night – selecting to study in the same space again and again.

What is also interesting to note is that college and university students are much more engaged with their parents than previous generations. This could be partially attributed to being raised in a security-conscious society where parents keep close tabs on their children. As a result, parents schedule their child's every activity – from school, to sports, to social events. Students text-message parents throughout the day and will ask them for help locating information for a research assignment as well as to proofread drafts (George, 2007).

Finally, when creating space for use by students, recognizing students' wants and needs, instead of creating what we think they need, is imperative to effective design. It is not uncommon on campus to hear administrators and sometimes faculty promoting changes to the library in terms of absolutes. The myopic view is to radically alter the physical library so that it becomes a glorified high-tech café/student union/student support services building by relegating the general and special collections to offsite, or underground locations, or in buildings connected to the main library building in compact shelving, that is closed stacks, and/or with robots retrieving materials. An educated approach is to ask students what makes the library one of *the* places on campus to do research and study?

Jackson and Hahn (2011) explored this question by assessing the "sacred" aspect of "library as place." Using research methods from the psychology of religion discipline,

Jackson and Hahn surveyed 54 graduate and undergraduate students enrolled in three universities located throughout the USA. Interviews were conducted in-person, and respondents completed questions after viewing exterior and interior images of libraries. The images were categorized as being either "modern" or "traditional," where "modern" was viewed as more secular and "traditional" as more spiritual. This study found that students preferred using traditional-looking libraries over modern-looking ones, and would use a more traditional library over the library they currently used, while using a modern library less often than the library they currently used. The results of this study are critically important in creating student spaces in academic libraries. Students crave traditional library settings, such as book stacks, alongside technology, cafés, writing centers, etc. According to Jackson and Hahn (2011: 436), "being around books makes them feel more scholarly and connected to the institution's educational mission."

Moving forward in developing and recreating new space for student use does not mean out with the old and in with the new. Quite the opposite. It means that traditional aspects of the academic library make a significant impression on all who enter its doors. Staples of academic library infrastructure – both within and outside the library – resonate with students. Students feel a connection between the traditionalism that the library represents to the institution's vision and mission, and to the scholarship that has come before them and which they are now a part of.

## *Faculty use of library space*

"Good libraries attract good scholars" (Hamlin, 1981) – or at least that was the mantra that began in the 1940s in colleges and universities in the USA. It is interesting to note

that a search of the literature uncovers research on faculty involvement in library operations, such as acquisitions and serving on library advisory committees, but a dearth of information on how faculty use library space. From Atkins (2003), we know that the "reputation of an individual faculty member comes from the recognition accorded his or her personal research by peers in the discipline and by the shared, collective reputation and visibility of the academic department." So, it would logically follow that the use of information resources and library services is critical to the success of faculty in obtaining promotion and tenure. With e-resources so prevalent, locating quality information for research, study and learning for most subject areas does not require visits to the physical library building. Subjects that are exceptions include disciplines in the arts, humanities and some in the social sciences. By their nature, areas within these disciplines rely on the exploration of information available in print format. Furthermore, as not all material is digitized, accessing the materials frequently requires visits to the library building itself.

Information about faculty use of library spaces, albeit not plentiful, is interesting and informative in designing academic libraries for today and tomorrow. Research by Engel and Antell (2004), Antell and Engel (2006), Lewis and Moulder (2008) and Schonfeld and Housewright (2010) provides relevant insights into faculty use of library space.

Engel and Antell (2004) describe the results of a survey of Association of Research Libraries (ARL) and faculty interviews regarding the use of faculty spaces in academic libraries. They conclude that faculty do use spaces dedicated for their use and value these spaces, particularly those in the humanities and social science disciplines. The mean number of faculty spaces (i.e. carrels and studies) at each library in the study was 122 and ranged from three to 680. The

authors define a "carrel" as a lockable space with a desk, bookshelf and chair; and a "study" as a space larger than a carrel with sometimes more furniture. Faculty used these spaces for silent reflection and as a place to concentrate without interruption. According to Antell and Engel, faculty seek an "oasis of solitude" in order to work without being distracted. In a survey of faculty at the University of Oklahoma, the same authors discovered that younger scholars were much more apt to use dedicated faculty space within an academic library than their older colleagues (Antell and Engel, 2006).

Lewis and Moulder (2008) also surveyed ARL member libraries and discovered that 74 percent of respondents planned on adding library space specifically for graduate students and for faculty. In addition to traditional carrel and faculty offices, this study found that academic libraries were creating larger spaces that offered a variety of services for graduate students and faculty, such as conference rooms, high-tech classrooms for faculty to experiment with new teaching pedagogies, media production, geographical information systems (GIS), statistical support, and high performance and research computing. Academic libraries are also establishing exhibit areas and using digital media such as large-screen panels, where faculty can highlight their research.

In their faculty survey, Schonfeld and Housewright (2009) found a change in where faculty began their research. Faculty used to begin their search for information in the library in 2003, but by 2009 changed this habit by starting with specific e-resources or discovery tools, such as Google and Google Scholar. Initial searches would be for full-text e-articles, reviewing article references for relevant citations, and searching databases for citations. According to Schonfeld and Housewright, faculty have changed their searching habits so that the physical library is no longer vital to their research.

Regarding faculty use of library spaces dedicated specifically to them, a review of the literature reveals conflicting results. While some scholars found that faculty are using carrels and studies designed to support their research (Engel and Antell, 2004) and that younger faculty use such spaces more than their older colleagues (Antell and Engel, 2006) others have found that faculty use of the physical library has decreased with the rise in information available online (Schonfeld and Housewright, 2009). Wilson (2003) predicts that faculty and graduate student use of the library will continue to decline. However, current research on building academic libraries in the digital age concludes that spaces specifically designed for faculty are not being included in new library construction, but that this does not mean that faculty do not use the physical library (Stewart, 2010). For example, faculty may use other places in the library (e.g. a table in a study area, the café, etc.) not dedicated for their specific use. Additionally, faculty use of faculty library spaces may be institution-specific. One respondent in Stewart's study found an increase in demand for faculty space, while another reported such low usage that the spaces had been opened up for undergraduate use.

Designing library space for faculty use requires an analysis of faculty's current library use, specifically what space they are presently using, and what space they would use were it available. Academic libraries that house faculty spaces that provide support include Ohio University's Faculty Commons in the Alden Library and the University of Virginia's Scholar's Lab and Research Computing Lab (Lewis and Moulder, 2008). Such spaces frequently provide faculty teaching and research support services such as multimedia production, offices to consult with subject experts (librarians), and the opportunity to work with new digital technologies. Given what is known today, designing faculty space within the

library will need an understanding of how faculty would use such areas. Design may be institution-specific until such time as additional research is conducted on how faculty engage with the physical library building.

## Current thinking in academic library design

Current thinking about academic library design is significantly different from the models used in the 1990s and the early 2000s. As new libraries were being constructed and existing libraries renovated and/or expanded, design was strongly influenced by the library services offered. Circulation, interlibrary loan, reserves and reference service drove design choices. Little attention was paid to how students and faculty were using existing library space, and, more importantly, what they were experiencing within the building itself.

Focus on library services did not reduce usage, however. Research by Shill and Tonner (2003, 2004) provides empirical evidence that the use of academic libraries increases after a new library is built or an existing facility is renovated and/or expanded (Shill and Tonner, 2003). In their 2004 study, Shill and Tonner found that 80 percent of libraries that improved their facilities from 1995 to 2002 saw an increase in use after the projects were completed.

Recently, however, serious consideration of student learning styles is influencing interior design, with particular attention being paid to the social aspect of teaching and learning, referred to as the scholarship of teaching and learning (Francis, 2007). According to Bennett (2003) the traditional method of designing libraries around services has begun to shift to exploring libraries as places where learning happens. In the 1990s, libraries studied workflows, use of

open floor plans, and the availability of telecommunications technologies. Today, the primary question has changed from what library services can be offered to looking at what activities students and faculty would engage in when learning about and exploring new concepts.

Why this shift in perspective? This new emphasis on the library as learning space is, in part, being pushed by the economic reality of construction costs. Renovating, expanding and building a new building of any type is a significant investment – not only in terms of initial outlay of capital, but also the requirement of a constant flow of resources needed to maintain the facility. Institutions of higher education are taking serious stock of their return on investment. As such, pointed questions are being asked: Will the improvements result in tangible results? Will student retention rates increase? What is the lifespan of the design? Is the design flexible enough to meet the future needs of students and faculty?

On most campuses, library construction projects compete against other capital projects, such as new science buildings, renovated theaters, or upgrading athletic facilities. Librarians need to have a strong, significant, credible and authentic argument to support the investment of large amounts of money. Service improvement is not viewed as a compelling reason for renovation, expansion or new construction. Demonstrating tangible positive impacts on student learning in terms of academic achievement and retention is directly connected to most missions of higher education institutions. As Bennett (2003: 39) notes, "the learning commons [concept] … becomes perhaps the single most powerful spatial expression of the educational role of the library."

## Conclusion

Thoughtful design of building interiors is critical to creating effective, long-term use of a specific space. Studies on workspace and K-12 classroom design have found that good design results in increased productivity, general life outlook and better student performance. Research has also shown that better results are obtained if those who will use the space are involved throughout the design process.

Academic library interior design is undergoing a significant shift. In the 1990s and early 2000s, librarians focused on the types of services offered to patrons to drive design concepts. Today, the shift is away from service-oriented design and towards creating effective spaces where learning happens. This change in perspectives is partially the result of rising construction costs that are pushing higher education institutions to be confident about their return on investment made in library capital projects. More importantly, developing spaces within libraries that not only meet student and faculty needs, but also have a direct impact on student learning and retention will continue the library's role as central to the educational mission of any academic institution.

# Creating user-centered spaces in academic libraries

**Abstract:** Chapter 2 guides the reader through the process of creating user-centered spaces in academic libraries. Strategies for gathering input from students and faculty, including site visits, online searching for information and examples, surveys, focus groups, opportunities for interacting with students and faculty, and involving students in project design give the reader options to obtain important information. Developing a concept plan from beginning to end, practical advice to address potential pitfalls in communicating the project, including why the project is needed, are opportunities to greatly improve the chances of success. Tips on keeping to the project timeline are given.

**Key words:** academic library design, concept plans, feedback, focus groups, interior design, user-centered spaces

## Introduction

Having the opportunity to take a space and transform it into something fresh and new is very exciting. Just like starting with a blank slate or canvas, you are beginning with whatever your imagination creates. This chapter will guide you through the process of creating user-centered spaces in academic libraries. You will be able to use this process when designing an information or learning commons, spaces for

collaborative as well as for individual study, or any space where the focus is on user activities.

## Getting started

Interior design can be both exhilarating and intimidating at the same time. Sitting in front of a blank page provides you with the freedom to draft the ideal user space. However, you and your team may find that, creatively, you are stuck. Not to stereotype, but us library folk tend to want a place for everything and everything in its place. The tendency may be to line up rows of tables with chairs; select a neutral paint color, such as beige or tan; and replace a carpet with an almost identical design. There is something within the librarian culture that does not encourage us to take risks beyond moving the reference desk two feet to the right and even then only after several meetings to discuss the possibility. This tactic is no different from simply reupholstering the (possibly ergonomically flawed) chairs or finding a local seamstress to fashion new curtains out of recycled fabric. The point here is not to poke fun at our profession (although this in and of itself is enjoyable), but to enlighten you to the fact that, at the very first stage of design, you and your team are encouraged to let go, be creative, think outside of the box, and push the boundaries of traditional library design.

The best projects seem to begin when you and your team sit down with that blank piece of paper. Sketch out potential ideas. List everything you would like to see incorporated into the space. Don't hold back and do not worry about funding at this point. You can always edit down your list of wants and needs.

## Strategies for gathering ideas

A plethora of resources are available for you to gather interior design ideas. There are so many options that you might feel overwhelmed. You can go on site visits; search online; pick up ideas at conferences; participate in workshops, webinars and institutes; and take trips to spaces, such as hotel atriums and concierge areas, that you think might work as part of your project. Having the opportunity to select from various design concepts will assist you in seeing what may or may not work in your space. Keep this initial gathering of information as broad as possible so that you can select from a good mix of options.

Refreshing ideas will present themselves during site visits – some you will identify as possibilities, others you will discard. Starting with a geographic area of a half-day's drive or less from your library, select a few places to visit. These need not all be academic libraries. Find out which public libraries, community college libraries, or school libraries have been recently built or renovated. Of course, take tours of academic libraries that are new or recently refurbished. With an adequate budget, you can expand your search for new builds and/or renovations within a day's drive and beyond. There is no general guideline as to how many site visits you should conduct. However, a good rule of thumb is to visit construction that has occurred within the past five years so that you are experiencing fresher concepts. If the space has been in use for a while, you can ask library staff what would be kept and what would not be built if the project were to be started again from scratch. Wherever you visit, take plenty of photos. Record where you visited, the date of the visit, and what is in each picture. This will make future reference and discussion go much smoother.

Searching online for ideas may provide a wealth of options. Searching +academic +library +renovation using any search engine should return hundreds if not thousands of example projects. Limiting your search by "images" and/or "videos" will give you photos or a virtual tour, respectively. Major library construction projects will frequently post visual updates online and some even provide a live camera feed of the construction. Online examples include the newly constructed information commons at the University of Loyola Chicago (Figure 2.1; *http://www.luc.edu/ic/*) and at Loyola Marymount University in Los Angeles (*http://www.lmu.edu/about/departments/reference/Information_Commons.htm*). Another resource is *American Libraries* magazine, which usually dedicates its April issue to



**Figure 2.1**   **Exterior of the Richard J. Klarchek Information Commons at the University of Chicago Loyola, Chicago, IL, USA**

Photo credit: Robert Seal/University of Chicago Loyola, 2012

showcasing the best in all types of library architecture. Its Spring 2010 Digital Supplement (available at *www. americanlibrariesmagazine.org*) also contains a selection of environmentally-friendly new library construction and renovation. You can then follow up your research by asking questions of the library director, project manager, librarians, architect, or anyone involved in the project.

An effective method of gathering information from available resources is to divide and conquer responsibilities. Have team members select at least one (if not more) information-seeking task – whether it be a search of the literature, gathering images and videos, talking with vendors, or going on site visits. Create a site online where this information can be shared with the team. Also consider setting-up a "war room" where blueprints, concept drawings, photos, etc. can be posted and consulted; where others can be invited to comment; and where the team can meet throughout the project.

## Gathering input

Academic library construction is seldom successful if done in isolation. What librarians think users need and what they actually need are usually two different things. As such, it is important to seek input from students and faculty – the primary users of library space.

Several strategies, such as online surveys, focus groups and opportunities for in-person responses, can be implemented to obtain feedback from students and faculty. For example:

■ Create a brief (no more than ten-question) online survey using an electronic survey product such as *www.surveymonkey. com*, to ask questions in a variety of forms (e.g. multiple

choice, ranking, Likert-type scale, etc.) including open-ended questions that allow written comments. Analyze survey results in terms of number of responses, percentages, written feedback themes and so on.

- Conduct focus groups with students and with faculty. Schedule these during times when each group is available. Most focus groups run for no more than 90 minutes with a short break halfway through. You will need a person to facilitate group discussion and another individual to record the conversations. Conversations need not be recorded verbatim, but it is important to capture the main themes. A librarian or library staff member can learn how to facilitate a focus group as well as how to record the session. You can also check with faculty on campus as some professors have appropriate skills that they are more than willing to share. The focus group works best if offered in a comfortable environment with refreshments and snacks.

- Create opportunities for student and faculty feedback by hosting information tables across campus, such as in the student union. Have flipcharts available for library users and non-users alike to share their comments and be on hand to explain what you are doing as well as to answer any questions.

- One of the more creative ways of engaging students in the project design is to make concept design for the library a part of a course. Michelle Twait (2009) did just that when she created her "Library as Place" course. Throughout the course, students were required to design their favorite study space, tour libraries, participate in "visioning workshops" and then develop a library concept plan. Course outcomes were greater than expected. As Twait comments, "The students brought creativity and

imagination to this project; questioned accepted practice and tradition; were able to see the library with fresh eyes; and saw only possibility and potential without being bogged down by budget constraints."

Other feedback gathering strategies include asking a few students and faculty from different disciplines to serve on the library project planning team; and making presentations to both student and faculty groups including student government, faculty senate, department meetings, as well as in front of non-academic units such as business and finance, the president's executive committee and the institution's board of trustees. If your institution has very active alumni support, consider providing information sessions at alumni events such as homecoming.

It is important to obtain input on library renovation and new construction from those who will use it the most – students and faculty. Otherwise you run the risk of creating a space you think they need when, in fact, a different design could have been more effective.

## Developing a concept plan

Once you complete the information-gathering and feedback stage, you should begin to see a concept of your space emerge. At this point you are ready to develop a concept plan. A concept plan is a document or other type of representation, such as a three-dimensional model, that temporarily solidifies an idea. It may not be the final idea, but it usually has elements that will appear in the final plan. For example, if you are designing collaborative space for students to work together on projects, common elements may include flexible, comfortable and easy-to-move furniture;

lighting that can be moved and/or adjusted; close access to electrical outlets to connect laptops; wireless access; and portable write-on/wipe-off boards. Exact placement of items might not have been determined, but essential components of the space should be identifiable.

As you review all of the information, images and feedback, be open to creating multiple concept plans. Feel free to move things around. Switch the location of furniture. Move the information desk to the center of the room. Remember that you are still in the design phase. You are creating ideas on surfaces (paper, whiteboards, 3D software) that are easily erasable.

Enjoy the process of creating and recreating a space. Develop as many concept plans as you want. You can always (and you will) go back and edit your designs. Editing the design before you are too far along in the process will limit your outcomes and you might then be disappointed that the space was not truly transformed as you imagined. In addition, ideas that emerge can typically be depicted in three concept visualizations. One or two designs are formulated with a third design showing variations on these "primary" or "main" concept plans.

## Concept plan in action

Once your team has developed anywhere from one to three concept plans, it is time to obtain more feedback from library users and non-users. Offering people no more than three concept plans enables you to obtain focused responses as you are not overwhelming your audience with unlimited choices. This can be accomplished in a variety of ways:

- Post plans on a website and ask viewers to complete a brief survey. Ask specific questions such as: "Do you prefer plan 1 or plan 2?" This can be followed with open-ended questions such as: "What, specifically, do you like about plan 1 or plan 2?"

- Create large visuals of each plan by mounting the proposed designs on foam board. Leave the boards in various locations around campus and ask for input. Here you could have library staff on hand to solicit input as well as to answer questions that may arise.

- Post a short video (no more than 7 minutes) or a PowerPoint presentation with voice-over briefly explaining the project. Present the concept plans, then ask for feedback via an electronic survey.

- Conduct focus groups. Give participants time to review each concept plan and then ask them for their opinions.

## A note of caution

At this point in the project your team will probably be very excited about the possibilities involved in recreating library space. However, some members of your audience may not agree with their enthusiasm for a library renovation or a new building. As such, everyone involved in the project as well as all library staff need to be well versed in the overall plan. It is recommended that library staff:

- Be very familiar with the history of the library and how this project came to be. A brief library history with key points is all that is needed here. For example: The University's library, built in 1920, met the needs of

students and faculty at that time. Over the next several decades, the library was renovated twice – in 1955 to replace carpeting and furnishings; and in 1985 to construct a new library entrance.

- Be able to succinctly explain why renovation/new build is needed. For example: Students and faculty have consistently requested a renovated/new library for at least the last five years, as evidenced by survey and focus group results. Use of the library continues to rise, per our gate counts, as enrollment increases.

- Be able to accentuate the elements of the project. For example: At the completion of this project, student study space will increase by 35 percent; group study rooms will come online; and faculty will have easier access to professional development opportunities through the new center for teaching excellence.

- Finally, be able to address positive outcomes of the project. For example: We expect positive impacts from this construction in terms of increased use of the building, a slight rise in enrollment and/or retention, and professors implementing new instructional pedagogies.

Expect library users and non-users alike to respond more explicitly as you and your team share various concept plans. Visual images are powerful tools in convincing others of what you want to achieve. You have moved from the discussion and "what if" stage to sharing potential plans that quite possibly will become reality. Some people may respond more viscerally than others. One of the best ways to convey the needs, wants and opportunities of the project is to make sure your team and library staff are well prepared to answer questions and address any concerns in a positive manner.

## Next steps

Once you have finished obtaining feedback, you and your team will need to read and discuss the comments received and answer the questions asked. Use this input wisely by looking critically at your plan in light of what others have said and/or questioned. This process may last for several hours, days or even weeks. The time available to you is dependent upon your project timeline. Too often teams become caught up in the minutiae – arguing over where to locate chairs and a table, or what color a desk should be. These are important decisions, but they are to be finalized later in the process. For now, the goal is to agree on a plan that is effective, workable and more importantly, transforms library space so that it changes users' experiences. Try not to let the minor details delay your project. Unless a major event occurs that will definitely keep you from moving forward, keep to your original timeline.

## Conclusion

The purpose of this chapter is to convey the process of how to get started on creating user-centered spaces in academic libraries. Gathering ideas through site visits, online searches and talking with vendors is frequently a very enjoyable part of the process. Gathering input from students and faculty – both library users and non-users – will give you a good sense of how people will use the building. Developing one to three concept plans enables you and your team to create visuals of what the space might actually look like.

Putting your concept plans out there for comment is exhilarating. Make sure that all library staff can succinctly

provide accurate information about the project. The project team is then ready to modify the concept plan(s) via feedback from students and faculty.

At this stage in the project you are still quite a way from breaking ground or hammering out drywall. The next chapters will give you insight into ideas and possibilities to consider as you finalize your plan.

# Universally-friendly spaces

**Abstract:** Chapter 3 considers the design of user-friendly spaces within the context of construction standards and the importance of elements of interior spaces. A broad overview of relevant rules and regulations developed by government agencies and professional organizations provides information that informs project participants about construction standards and building codes that must be adhered to in order to ensure that the project is legally compliant. This chapter discusses the development of user-friendly environments through color choices, flooring options and installation, furniture selection and placement, task lighting and security planning. Additionally, this chapter focuses on creating comfortable interiors via appropriate heating, ventilation and air-conditioning systems. Key manuals, national and international standards, including safety and performance standards for various components of a project are cited.

**Key words:** color selection, construction codes, construction standards, ergonomics, flooring, furniture, HVAC, lighting, security, student preferences, universal design

## Introduction

As noted in various chapters throughout this book, academic libraries are used for a wide variety of activities. Design can be narrowly focused on specific tasks, such as processing collections, storing rare materials and for quiet study, as well

as creating spaces that have multiple purposes and uses. Today, due to rising real estate, building and construction costs, interior spaces in academic libraries are designed to serve as many needs as reasonably possible. For example, where once the open areas within the library were designed with permanence in mind – large solid oak tables with immovable task lighting and straight hard-backed chairs – this is now being re-envisioned in terms of flexibility to meet multiple needs. Solid wood furniture is being replaced by smaller, lighter tables and chairs on wheels or casters so that library users can quickly move furniture to fit their needs of working independently, in groups, or configured to hear a lecture or presentation. Reference service space, where librarians would once sit at an oversized desk to answer questions, is being replaced by a single information service point offering circulation, reserves, interlibrary loan/document delivery, technical support and reference service. New information desks usually have multiple heights to best meet user needs – counter height for quick queries and materials access as well as table height for in-depth reference consultations. Computers once hard-wired on long tables placed in rows have been replaced with easily movable furniture that contains electrical outlets so that library users can reconfigure tables and chairs, plug in their laptops and other portable electronic devices, and do their work. Several important design elements require close attention in order to make spaces universally-friendly, even when space was designed with flexibility in the first place.

Regardless of library space, color selection, correct lighting, security, interior comfort (e.g. temperature, humidity and noise control), durability of materials (e.g. furniture, flooring, shelving) and usability of technology all impact the individual's library experience. Additionally, the construction industry, together with governmental agencies, have

developed codes, regulations, specifications and other standards that must be applied to the building of almost any type of structure. This chapter provides a brief overview of various government agencies and professional organizations that maintain, revise and update construction standards, as well as information for the reader to become familiar with the key design elements listed above.

## Of rules, regulations and standards

National professional organizations and governmental agencies have published standards indicating the requirements that must be followed, or are strongly recommended to be followed, when constructing a building. Standards, rules and regulations are codified for everything from the mixture of cement used to floor load capability, from ranges of interior temperature and humidity control to building structures that can be accessed by the physically challenged. Standards may vary depending upon the geographic location of your library. As such, it is a good idea to become familiar with the building and construction codes in your area. Architects and construction contractors know the regulations that must be followed. Being familiar with some of the organizations, government agencies and other terminology will help you understand issues that may present themselves during the design and construction phases of your project.

Design, building and construction codes are complex. Due to their complexity, such codes are quite expensive to develop and subsequently revise. Many cities, towns and regions sometimes use what is called a model building code. The organizations responsible for developing construction standards create, update and maintain these codes. Before construction begins, the architect and contractor will

determine which set of codes they will adhere to when building or renovating the structure. Below are some examples of agencies and organizations that develop and maintain these standards:

- *International Code Council (ICC)*: Founded in 1994, the ICC's purpose is to develop, revise and maintain building codes that could be used anywhere, regardless of geographic location. The ICC produces many publications, including *The International Building Code* (ICC, 2012), code source field guides, and specific texts on architectural, electrical and green/sustainability matters, as well as many others. The ICC is followed mostly in North America.

- *USA*: At the US federal government level, a number of agencies develop and maintain building codes. Of particular note are the Department of Labor's Occupational Safety and Health Administration (OSHA), which publishes the *OSHA Technical Manual* (Department of Labor, 1999) and the Department of Justice, which administers the Americans with Disabilities Act through the *ADA Standards for Accessible Design* (US Department of Justice, 2010). Other agencies empowered to influence building codes include the US Department of Defense (*http://www.defense.gov*); the National Parks Service (*http://www.nps.gov*); and the General Services Administration (*http://www.gsa.gov*).

- *Canada*: Canadians follow the National Building Code of Canada created by the Institute for Research in Construction, under the National Research Council of Canada (2010).

- *Europe*: Most European countries are looking at adopting the newly created Eurocodes developed by the European Committee for Standardisation (n.d.).

Various organizations develop and maintain standards related to specific elements of construction. For example, the American Society of Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE)'s *Standards and Guidelines* are the de facto standards for the HVAC industry (ASHRAE, 2011). Although technically voluntary, such standards are taken seriously in the construction industry. Other key organizations include ASTM International (formerly the American Society for Testing and Materials), which writes global standards including specific standards for concrete, thermal insulation and roofing to name a few, and the American National Standards Institute (*http://www. ansi.org*), which oversees the development and application of standards related to every aspect of the construction industry, as well as officially representing the USA on the International Organization for Standardization.

## Universal-friendliness

Construction standards and building codes will guide your project in terms of types of materials that must be used; specific measurements for entryways, exits and width between book stacks; and prevention technologies for fire protection. Rules and regulations are strictly applied to any change in the construction of the library that you are planning on doing. Of equal importance are the elements that you select to define each space. Color, flooring, furniture, lighting, security and comfort of the interior of a space all have an impact on the workability and usability of areas within the library. Being knowledgeable about interior design will enable you to create more ideal spaces for library users.

# The importance of color

In terms of selecting interior colors for libraries, library interior designer expert McClintock (1989) says that color selection is "usually the first and most important design and color choices made for an interior." Determining which colors work best and make the most positive impact on the individual or that work best in specific situations is an area that is actively researched on a variety of levels. From selecting the appropriate colors for interiors of homes and buildings, to finding the correct color to paint airplanes, to market research on consumer products, color selection is a significant factor in the way people react to a specific product, a particular room, or a proscribed space.

Cross-disciplinary research on color perception and effect is on the rise, especially for scientists, psychologists, designers and artists (Hutchings, 2006). Why is this? Research shows that color choice can have a profound impact on the user experience of a specific space. In their study of how color affects student behavior, sense of wellbeing and academic success, Johnson and Maki (2009) discovered that colored walls decreased the number of times a student went off task, decreased anxiety levels, and had a positive effect on perceptions of learning when compared with learning in an all-white walled room. In a cross-cultural study, Kuller et al. (2006) discovered that both color choice and light level influence employees in the workplace. Those in a more colorful work environment expressed a more positive outlook than when a muted to moderate color scheme was used. The color blue was found to have a positive emotional effect on patients in a clinical setting (Verhoeven, Pieterse and Pryun, 2006). It is also interesting to note that past color trends are not predictors of future color trends (Stansfield and Whitfield, 2005).

As Demas and Scherer (2002) point out, there are endless strategies and ideas to enhance library users' experiences. This observation speaks directly to color selection as there are virtually endless colors to choose from and never-ending color combinations. On a more philosophical level, Riley (1995) states that the "sheer multiplicity of color codes attests to the profound subjectivity of the color sense and its resistance to categorical thought. Color behavior does not conform to one paradigm, chart, or episteme."

As explained by, among others, Indow (1988) "true" color representation includes three different dimensions: hue (the name of the color), value (darkness or lightness) and saturation (brightness or dullness). The color you actually see is also affected by lighting textures as well as materials found in the location where the color resides (Read and Upington, 2009). Riley (1995) takes this a step further, explaining that the way one perceives color is also influenced by subjectivity, mood, memory, association, habit and time.

So how do you select the right color and/or color palette for a specific space? One approach is to stay within a small palette of colors (McClintock, 1989). Using a limited number of complementary colors will enable library users to identify spaces easily. Frequently, a base color is selected followed by a complementary color and, sometimes, an accent color. The base color is used the most in a given space. The complementary color is used to balance out the area. An accent color applied sparingly, yet strategically, will visually provide a "pop" of color.

Just because you use a small selection of colors does not mean you need to be safe by selecting slight variations of the base color. Users will find looking at subtle shades of blue or brown quite boring. On the other hand, you need not be so trendy as to awash an area in color combinations that are plain garish to view. A palette of muted greens and tans

works as well as one of stronger blues and yellows. As you visit other libraries and places, notice what color combinations work and which ones miss the mark. Ask users of specific spaces about their reaction to the color in the space. As you do your site visits, you might notice a color theme or scheme for certain spaces. Additionally, ask paint vendors for large-sample color chips. Mix and match colors using the chips. Place them on the floor and on the walls. Notice how the color changes under various lighting situations. Painting small areas of a wall using sample paint colors (that you can obtain from a paint vendor) will provide an even more accurate depiction of what the space will actually look like once completely finished. If possible, ask the paint vendor to show your space with various colors using their paint visualization software. This yields the closest depiction of what to expect in a specific space in terms of color(s).

## Flooring selection and care

Flooring selection and care is just as important as selecting a color palette. Deciding to select and install one type of floor throughout an entire library in order to save costs by purchasing significant square footage is in disservice to the effective use of the building. Floors are designed to make use of space. As with other elements discussed in this book (e.g. lighting, HVAC, etc.), one can find a plethora of flooring product choices. Libraries tend to replace flooring infrequently. Their floors are expected to be resilient and, in some instances, are expected to be replaced every 20 years or so. The wide range of flooring materials and types created with today's technology provides for more flexibility when compared with the limited choices of the past. This section provides a brief overview of flooring standards, options and advice.

## Flooring standards

There are flooring standards for both commercial and residential purposes. In the USA, the ASTM develops flooring standards that address composition (physical and mechanical) as well as installation procedures. Similar organizations exist in other countries. Floor covering standards guide manufacturers and installers in understanding the resiliency levels of various products. Products are tested for impact, flexibility and stability in terms of the elements (e.g. heat, light, etc.), slip resistance, noise transmission and electrical resistance. The overall goal is "to test floor coverings to ensure strengthened quality towards safe utilization" (ASTM, n.d.).

## Matching flooring and space

Types of flooring available for library use are plentiful, and include carpeting, carpet tiles, hardwood, cherry, oak, walnut, bamboo, teak, laminate, linoleum, cork, cement, glass, ceramic, Terrazzo, other types of tiles, marble, stone, raised flooring, flooring made from recycled materials, floors made from rubber, and floors that meet Leadership in Energy and Environmental Design (LEED) certification requirements, etc. Science plays a key role in the development of newer, safer and more environmentally-friendly floor coverings. For example, the Carpet and Rug Institute (*http:// www.carpet-rug.org/*) uses scientific methods to determine a product's level of chemical emissions (as related to air quality) to make sure the product can be cleaned easily with eco-friendly solutions, and to develop methods for the recycling and reuse of carpets and rugs.

Every type of floor covering has advantages and disadvantages. It is imperative to match the flooring's

attributes to the activities that will occur in a specific space. Here are some examples for consideration:

- Resilient flooring (flooring that "gives" when you walk on it) reduces traffic noise as opposed to hard-surfaced flooring (e.g. marble, concrete, wood) that is not sound-dampening.

- Durable floor coverings are an important attribute to consider in all situations, especially in high-traffic, high-use areas.

- Raised floors are useful when extensive electrical, cable and other wiring needs to be installed in a space. It also assists in addressing air temperature and air-flow issues. However, raised floors tend to be noisy when walked upon. There is also the possibility of raised floor tiles coming loose, resulting in people stepping through the floor itself.

- Cork floors were popular in libraries in the 1950s and are presently enjoying a mild resurgence in popularity because of their capacity for sound dampening.

- Flooring with slip-resistant properties should be installed in high-traffic, high-use areas such as entryways, lobbies, stairs and atrium spaces.

### *Flooring selection and installation*

Flooring can be one of the most expensive items on your construction list. Cost depends upon type of floors chosen; the number of kinds of flooring selected; flooring characteristics (e.g. level of durability, etc.) and installation requirements. Expectations of a floor's durability and longevity are high. We want floors that are going to look as

new 5–10 years from the day they were installed. Occasionally, a floor-type will be selected because it looks good at the time of design. At this point, it is best to think about how and when the floor will be most heavily used. For example, tan-colored carpeting, when freshly installed in a library, can look stunning. Imagine the look of the carpet after a month's worth of foot traffic. The vision of a pristine carpet will be significantly diminished to the reality of muddy, dirty shoe prints, stains from the spilling of various kinds of liquids, book cart track marks and so on.

Before deciding upon floor coverings, spend time in each area to be refloored. Observe the areas at various times of the day to determine the amount of traffic and traffic patterns. Look for such activity as:

- Are people walking fast or slow?

- Are they walking confidently or tentatively due to a fear of falling? How safe is it to walk on without tripping, slipping or falling?

- Is it an area with a lot of book cart traffic? Are staff having to push carts over floor strips or other obstacles? Are patrons in wheelchairs experiencing challenges by having to navigate similar obstacles?

- Are pre-determined quiet areas quiet? Does sound carry or echo throughout the space?

- Is the current flooring acting as a guide, subtly directing people to various locations within the library?

- Are areas of the library defined by the type, color and texture of the flooring?

- How long does it take for the area to get dirty? How frequently is it cleaned? How easy and cost effectively is it to maintain?

It is difficult to determine if one type of flooring can be installed in the building or if several types will need to be purchased. Heavy-traffic areas, such as entryways and hallways, require a very durable floor. Bathrooms almost always have ceramic tile or linoleum flooring, as opposed to carpeting, for ease of cleaning.

In addition, consider whether or not the entire floor will be replaced or only a portion of the floor. It is not uncommon, for example, to remove bookshelves to find either original flooring (e.g. carpeting) under the shelves or no flooring except basic concrete or sub-floor. Whether to completely install flooring or floor around stationary items is a key consideration as to the cost of this portion of your project.

Once flooring is selected, remember to determine the type and size of molding to use to keep the floor secure, between the floor and the wall. Baseboards and cove molding are available in various sizes and designs and can frequently be purchased or painted to match the floor, the wall color, or some contrasting hue. Six-inch molding will provide more protection from wear-and-tear than three-inch molding. Any type of floor (commercial or residential) tends to be uneven and not level. The flooring contractor will most likely need to make adjustments to floor and baseboard installation so that the look and feel of each floor is level. How much adjusting is required will impact the cost of the project.

Flooring selection and installation can essentially "make or break" your project, simply because it is always visible and in constant use. Poor floor design can be a costly error which staff and patrons will need to live with for a long time. The best advice here is to:

■ Become familiar with types of flooring and the advantages and disadvantages of each.

■ Visit as many libraries as possible that have recently completed flooring projects. Include academic libraries

as well as public and school libraries in your search. Public and school libraries sometimes have completed renovation more recently than academic libraries, thereby giving you the opportunity to see newer textiles in use.

- Talk to as many librarians and library staff as you can about their experiences with flooring selection and installation. Candid conversations reveal important pieces of information that you may not have considered.

- Hire a flooring consultant. FCITS (formerly the Flooring Consultants and Inspection Training Service) in the USA offers a list of professionals certified in this area (see *http://www.fcits.org*). Other countries have similar flooring certifications and associations of professionals.

As with other components of your project, floor design, selection and installation require careful planning. As floors are so visible, the correct selection and care of floor coverings cannot be overstated here. Time spent learning about textile durability, cleaning requirements and usability in library spaces is time well invested in the success of your project.

## A place to sit

Furniture selection is probably one of the most enjoyable aspects of library renovation and construction projects. However, today's technologies, textiles and other materials provide endless options which may result in furniture-option overload. As with floor selection, furniture is expected to be exceptionally durable and easy to maintain.

So how does one go about furnishing an academic library? Although there is no one right answer to this question, Bennett (2005) advises the following: "To ask students what kind of seating they prefer, or to give them sample chairs to

evaluate, while useful, is to remain focused on the operational issue. To ask first how students learn and then to design environments, including seating, to foster that learning is to focus on learning."

As well as other elements of Universal Design (e.g. flooring, lighting, color selection, etc.), looking at the use(s) of each space, as well as adjacent spaces prior to furniture selection is highly recommended. Consider what primary activities will occur in the space. Will library users be in the space for a short period of time (e.g. a few minutes to check email?) or a longer period of time (e.g. a few hours to study?) Will people be working individually or in groups? Do you anticipate users moving the furniture to create different groupings or will the furnishings remain stationary? Does the space allow food and drink? Is the space designated as silent study? Remember, students come to the library because they are motivated to study. Most students identify a favorite place to study and develop a strong behavioral response of immediately getting to work when they go to that place (Demas, 2005). The onus is on us to populate library spaces so that they are used effectively and not designed to look like the living room or parlor that our mothers' designed for display only – in other words, not to be used. In contrast, newly designed library spaces will be heavily used if created to meet the users' needs for that specific space.

## *Student preferences*

Today's students do academic work quite differently from those of the pre-internet era. Perfectly aligned rows of solid wood tables and hard-backed chairs do not mesh with the study habits of today's college and university students. According to Kennedy (2004), students use task chairs to do computer work; prefer soft cushion seating for longer study; and will reconfigure

furniture to meet their needs and liking. Kollie (2005) points out that library user preference is for comfortable furniture that can easily be reconfigured. "Generation Y is used to putting their feet up on furniture. They're used to reclining in a lounge chair or sofa. They're used to eating and drinking with books and computers nearby." Our goal, then, is to create different spaces that offer a variety of seating options and groupings for individual as well as group study. Furnishings need to be durable, easy to clean, and technology-friendly with electrical outlets, if not within the furniture itself, then immediately adjacent to where students sit.

## Ergonomics

Furniture design has greatly matured since the early 1990s, giving libraries options for more comfortable and useful furniture. This is due, in part, to the study of ergonomics. AccessScience (n.d.) defines ergonomics as the "study of human capability and psychology in relation to the working environment and the equipment operated by the worker." Ergonomic design of workspace furnishings came into the public eye around 1994 when US-born designer Bill Stumpf created the Aeron chair for the Herman Miller furniture company. The Aeron chair had a flexible design that could easily be adjusted into a variety of positions to meet the needs of almost any size of person. The start of the use of computers in the 1990s resulted in an increase in repetitive strain injuries, such as carpal tunnel syndrome. Stumpf's design was so revolutionary in addressing issues such as worker fatigue, lower back pain and repetitive strain injuries caused by employees doing computer work for long periods of time that many furniture manufacturers continue to replicate and enhance his design.

Matching furniture to student and staff activities is important for comfort and productivity. Library users and staff tend to stay in one location in the library for hours at a time. For staff, an effective practice to determine type of furniture to purchase is to have staff walk through their daily work routines. Map job tasks performed in terms of physical movements (e.g. How many times does someone sit, stand, kneel, turn right and left during the day? How long does that person stay in each position?). Note the size and configuration of furniture in the space. For example, is the circulation counter too high or too low? Are the chairs at the circulation desk height-adjustable? The same practice can be applied by observing students and asking them what furniture would work best for their study and work in groups. Figure 3.1 illustrates the ergonomically correct position for working at a desk with a computer.

Libraries that make ergonomically-friendly furniture available promote this information to their users. For example, on the website of the University of Oxford's Bodleian Libraries it is possible to see which of the university's various libraries contain adjustable tables and chairs as well as furnishings to work either standing or sitting (University of Oxford, Bodleian Libraries, n.d.). Likewise, the library at Seton Hall University, New Jersey boasts sufficient configurations of ergonomic seating options to seat over 1100 library users (Seton Hall University, n.d.), while Monash University Library replaced over 450 vinyl chairs with ergonomic ones in order to meet its strategic goal of providing "study spaces which meet the differing needs of users for group and individual study" (Monash University Library, 2007). These are only a few of the examples illustrating not only the importance of having ergonomically correct library furnishings, but promoting that the library makes flexible furniture available to meet people's needs for study, research and work.

18"-24"

Straight wrists

Adjustable lumbar support

90-degree angle

Adjustable seat

Feet on floor. Footrest if needed.
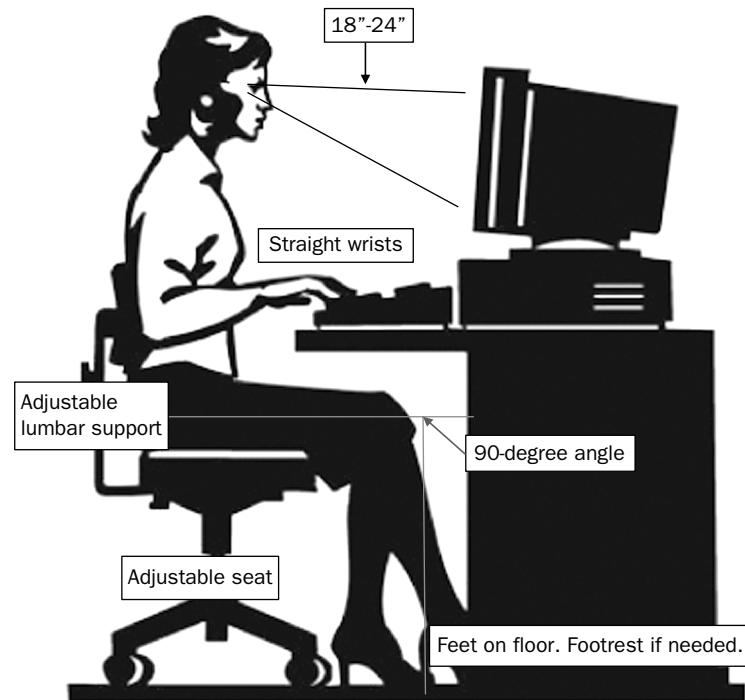
**Figure 3.1** Ergonomically correct position for working at a desk with a computer

## *Furnishing standards*

As with flooring and heating, ventilation and air-conditioning (HVAC) systems, the furniture manufacturing industry also has standards to follow in the design and construction of its products. In the USA, the Business and Institutional Furniture Manufacturers Association (BIFMA) reviews the ANSI/BIFMA Safety and Performance Standards every five years. Other territories have equivalent publications, such as the Standards Significant for Furniture Technology in Australia and New Zealand. Furniture standards are applied to tables, chairs, lounge seating, desks and workstation systems to name but a few. Furniture products must meet specific

standards for flammability, durability and textile consistency. Below is a brief guide to testing analysis standards that products must pass:

- *Flammability*: How quickly does the product ignite and burn?

- *Mechanical durability*: Mechanical testing of the product, as well as its various components, is conducted by pushing the item to its physical limits until it breaks. Adjustability, load bearing, various seating positions and frequent use of interlocking latches are all tested.

- *Surface durability*: Glass, wood, plastic, granite and other surface materials are tested for uniformity in terms of color, texture, scratch resistance and finish.

- *Fabric durability*: For woven textiles, cloth is inspected for flaws, fraying, raveling, tightness of weave, pilling, seam slippage, color fastness to light (i.e. resistance to fading) and wet and dry crocking (i.e. the transfer of dye used in the textile to another fabric/surface by rubbing).

One of the most important tests in selecting furniture fabric is the textile abrasion or "rub" test. Two types of test – the Wyzenbeek and the Martindale – are used to determine the durability of a specific type of fabric before it shows wear and tear. Fabric durability is rated according to the number of times it can be rubbed before wear and tear is detected. Residential fabric is in the 15 000 double-rub range. Commercial (including library use) fabric is 30 000 double-rubs minimum. Fabrics with ratings between 30 000 and 100 000 are recognized as being significantly durable (Pierce and Ostroff, 2009). Sina Pearson Textiles provides an easy-to-use chart of textile performance guidelines (see *http://www.sinapearson.com/act.html*).

Important legislation that needs to be followed in furniture selection is the degree to which furniture is disabilities-compliant.

In the USA, the Americans with Disabilities Act (ADA) 1990 contains ten federal laws related to protecting the rights of people with disabilities. Of particular interest to libraries are furnishings as well as entryways, exits, space between shelving units, height of water fountains and so on. In regards to furnishings, ADA specifies number of seats required, height, adjustability, knee clearance, etc. Other countries have similar laws including Canada's Canadian Human Rights Act 1977, India's Persons with Disabilities Act 1995, and the UK's amended Equality Act 2006. Globally, about 149 countries support the United Nations Convention on the Rights of Persons with Disabilities 2006, which is considered international law. As you design library spaces for students and staff, refer to disability-related legislation that will specify terms that require compliance with the law.

Selecting furniture for spaces in an academic library requires careful planning. Durability, flexibility, design for use and aesthetic appeal are to be considered as each piece is purchased. Attention to the needs of people with disabilities is required. Knowing seating standards published by professional library associations is also important. People come in all shapes and sizes so furnishings should reflect the diversity of the human shape. As Gee (2006) observes, "every decision you make or influence regarding interior spaces will affect the experience of the people learning and teaching in that space."

## Lighting to task

Selecting and installing the appropriate lighting is also critically important to the ultimate usefulness of areas within the library. For example, light-harvesting systems may save energy by not turning on lights when natural light is

available. However, using a light-harvesting system is ineffective if you need a flashlight to read call numbers located on books shelved in the stacks. Excessively harsh lighting can cause glare, while excessively soft lighting might not provide enough light for reading, writing or doing computer work. As such, lighting selection can also make or break the usability of your newly-constructed space.

There are multiple factors to consider when choosing interior lighting for your library. According to Leighton and Weber (2000), such factors include "reflective glare, direct glare, contrast, reflective qualities, the nature of the task, flicker, hum … aesthetics, scale, shape, intensity, energy consumption, the distribution of light, color, and cost of replacement."

Today's technologies provide superior options to traditional one-size-fits-all lighting solutions. No longer do libraries need to partially turn off banks of fluorescent tubes in an attempt to save on electricity (Woodward, 2009). The challenge is to find lighting options that match the activities undertaken in a specific space.

A good place to begin in selecting the best lighting fixtures for specific spaces is to determine the level of illumination recommended for particular tasks. The Illuminating Engineering Society (2001) recommends levels of illumination for library space (measured in foot-candles). Illumination ranges from 5 foot-candles for little used book stacks to 50 foot-candles for reading.

During this process of determining the best lighting solutions, Fitzgerald and Scherer (n.d.) suggest allowing for flexibility even when selecting task lighting; paying attention to glare, brightness and fixture variety; and understanding the use of the space – from being welcoming to creating a cozy reading space.

After determining foot-candles needed per space, you can begin selecting the light fixtures and lighting systems. This part of the process can be fun and daunting at the same time as there are limitless fixture possibilities in terms of sizes, shapes and colors. If you are not sure what type of fixtures you might be interested in, ask your design consultant to provide you with options. You can also search online for companies that specialize in library lighting (e.g. LiteControl's "Libraries Application Selector," which gives photographs of library lighting designs (LiteControl, n.d.); or see what other libraries have installed from reading the professional literature (e.g. Fox, 2010).

Libraries have come a long way from the pre-1900 era when the sun was the chief source of lighting (Leighton and Weber, 2000) and from the 1940s through the mid-1970s when some of the poorest energy-efficient libraries were built (Woodward, 2010). Working closely with your architect, builder, and/or lighting professional to select energy-smart solutions will provide you with flexible, useable space designed specifically for particular tasks at a cost-effective price (Piotrowicz and Osgood, 2010).

## A look at security

Security is critically important to academic research libraries. In the virtual world, cyber security – protecting online content and systems from being compromised by others – is a priority. Security is equally important in the physical realm of library buildings. Libraries without effective security measures leave library patrons and staff vulnerable to crime, leave collections open to vandalism and burglary, and make it easier for people to damage the interior and exterior of the building itself. This section explores security and safety issues and solutions in library buildings.

## *What are the concerns?*

Regardless of size – from the small and simple to the large and complex – libraries are places where all types of security and safety issues need to be accounted for and addressed. Library security and safety includes people, places and things. In this case, library users and staff, the library building itself and items within the library (e.g. collections, equipment, etc.). There is no limit to the types and severity of damage that can occur, whether it is manmade or natural.

Library administrators carry the responsibility of ensuring the safety of our staff and those who use our building. From relatively minor crimes such as stealing a cell phone or laptop to major crimes that severely harm others, terrible incidents can occur in any type of library, at any time. The event may be inside, outside, or to the building itself. The individual(s) committing the crime might be a library staff member, a library user affiliated with the college or university, or someone entirely unrelated to the institution's community, but who seeks to do harm nonetheless. The goal is always to provide a safe, secure, clean and comfortable environment in which individuals can do research, study and learn.

The physical building itself – both the exterior and interior and both public and staff-only areas – require attention to potential security and safety issues. Harmful actions such as stealing a staff member's purse, taking new books before they are processed, or having someone stalk library users in the stacks are unfortunately common events in libraries. The ease with which one can enter and exit the building as well as entering and exiting all areas of the interior spaces within the library need to be identified. Vandalism – being able to easily smash windows, hide in the bushes, or write graffiti on bathroom walls – also happens more often than we would like to admit. Moreover, natural happenings such as

floods, tornadoes, earthquakes and blizzards can damage materials beyond repair and can make the building unsafe to use. The entire building needs to be a safe and secure environment for all that use it or work there.

No type of library collection is immune from destruction or theft. Care needs to be taken to provide secure access to valuable materials, such as rare books and manuscripts. Too often we hear of a library patron who, over time, steals irreplaceable books. Fortunately, these individuals are eventually discovered when the materials appear for sale online, at a bookstore, or in a pawn shop. Individuals who may disagree with the selection of specific titles because they see the books as containing harmful information or images may cut or rip out pages from the book. They may also attempt to steal the item so that no one will have access to it at the library.

The library as place contains valuable material used by people from all walks of life. Many academic research libraries are similar to public libraries in that anyone is allowed to enter and use the information resources and library services. With this openness comes the potential element of harm to others or to one's self, as well as destruction or theft of property. As a result, library employees need to identify possible risks and implement strategies to mitigate harm or destruction.

## *Identifying the risks*

So how do library employees implement effective strategies to limit risk to library users, the building and its contents? Part of the answer can be found in risk management. Kahn (2005) defines risk management as "the evaluation and mitigation of and response planning for, possible threats or risk." In the

*Risk and Insurance Management Manual for Librarians*, Breighner, Payton and Drewes (2005) detail several key areas of concern when assessing the risk level of your library. These include:

- *Clearly identify risks:* What are they? Where are they?

- *Conduct risk quantification and evaluation:* What will it cost to make library users and staff, collections, equipment and the physical facility safe and secure?

- *Determine the level of risk avoidance:* What steps can be taken to avoid identified risks?

- *Minimize risk:* What controls can be implemented to prevent loss, theft, damage, etc.?

- *Replacement plan:* What is your financial plan to replace equipment and collections?

- *Re-evaluate risk:* How frequently do you evaluate the security and safety of your library? How often do you update emergency routines? How frequently does the staff participate in emergency preparedness training and/ or certification? How many times per year do you practice emergency routines (e.g. fire drills, building evacuations, etc.)?

Once you have identified potential safety and security issues through risk assessment, the next step is to evaluate potential security and safety "hot spots" within and around the building.

## Minimizing risk

A basic analysis of the building can be completed at any time to minimize risk and improve library safety and security.

Kahn (2008) suggests reviewing the following spaces both inside and outside the library:

- Look at the landscaping. Do hedges, trees, or other plants make it easy for someone to hide?

- Check the windows. Can they be opened easily? Are they of the type that can be smashed or broken?

- Tour all stairways, entryways and exits. Are locks in good working order? Are these areas well lit? Are emergency exit signs illuminated? Do doors that require an alarm have a working alarm?

- Look at parking areas, ramps, walkways, loading docks, delivery points and sidewalks. Is there sufficient, working lighting? Are emergency phones installed and working? Is the phone directly tied into campus security and/or the local police?

- Review places that require enhanced security measures such as the main entranceway/exit of the library, special collections areas, reading rooms and staff-only areas. Is video surveillance installed with current technology and does it work? Can the technology record and be archived automatically for a specific period of time (e.g. 6 months, 12 months, etc.)? Are motion detectors installed where needed? Do security gates work in identifying items leaving the library that have not been checked out? For areas that require key card or code access, are the keys and codes changed frequently? And are keys and codes held and/or known by only a few specified staff? Is your special collections reading room easily monitored? (See Breighner, Payton and Drewes, 2005.)

Security and safety of an academic library is a priority – not only in the post-9/11 world, but also as academic libraries are increasingly open 24/7. This section provides you with

potential manmade and natural occurrences that could compromise the building, users and staff; gives a starting point to embark on risk assessment; and provides suggestions for identifying security "hot spots" within and outside of the building. Although by no means comprehensive, this information represents practical introductory advice on making your library the safest and securest it can be. For additional information on library safety and security, see the ACRL and RBMS *Guidelines Regarding Security and Theft in Special Collections* (ACRL 2009).

# Interior comfort

Students and faculty tend to use libraries anywhere from a few minutes to scan the new books shelves or check email to hours researching and studying. The interior comfort of a space is important, whether one is quickly checking out a book, leisurely browsing the stacks, or studying for a final exam. The comfort level of a space is frequently determined by the air temperature, humidity and noise level in addition to furniture type, lighting, color scheme and general aesthetics of the space. HVAC and level of noise are key elements to become familiar with when designing library spaces. Having a basic understanding of HVAC systems as well as ways to address noise issues will enable you to design spaces that increase the level of comfort for library patrons.

## *HVAC*

"Heating," "cooling," "humidifying" and "dehumidifying" are specifically defined in the field of building and construction:

- *Heating* refers to "the transfer of energy to a space or to the air in a space by virtue of a difference in temperature between the source and the space or air." Sensible heat transfer is when air temperature rises from the transfer of heat.

- *Cooling* is similarly defined as "the transfer of energy to a space or to the air in a space by virtue of a difference in temperature between the source and the space or air." Cooling the air involves sensible heat transfer by decreasing the air temperature.

- *Humidifying*, also known as humidification, is "the transfer of water vapor to atmospheric air." As opposed to sensible heat transfer, humidification involves latent heat transfer whereby water vapor is added to air that is circulating in a specific space.

- *Dehumidifying*, also known as dehumidification, is a process whereby a percentage of water found within the air is removed. This process involves latent heat transfer as well (McQuiston, Parker and Spitler, 2000).

HVAC systems were of little concern in the development of early libraries. If heat was needed, a fire was lit in the fireplace. If the library needed to be ventilated and cooled, windows would be opened. Librarians relied on the natural environment to establish some level of comfort within the building. Unfortunately, these basic methods of environmental control were neither effective nor safe. Issues of fire, smoke, humidity and wide-ranging temperature fluctuations could not be efficiently controlled to produce an environment of even temperature and humidity. The development of HVAC systems and continued research on methods to more fully understand the level of temperature and humidity required for comfort of individuals, the preservation of rare materials and continued workings of servers and other information

technology-related components enable library spaces to be customized to particular uses.

Codes, specifications, regulations and standards exist for all types of buildings and vary from country to country and within countries. Standards and regulations are frequently geographic-specific and building-type specific. Codes and regulations not only include building materials (e.g. type of cement, type of steel used, etc.) to be used, but also include requirements for other significant building systems including HVAC systems.

According to Graham (2009), high-performing HVAC systems contribute to improve indoor environmental quality. All components (heating, ventilation and air-conditioning) need to work together efficiently to create or come close to creating and maintaining an ideal comfortable indoor environment. Frequently, there is an optimal range of temperature and humidity, based on research and set as a recommendation by a professional or governing body. For example, OSHA is the US government agency responsible for safety and health in the workplace. According to OSHA, Americans spend almost 90 percent of their lives inside buildings and other structures. An effective and efficient HVAC system is critically important in providing people with fresh air that circulates throughout the building. To meet this requirement, the *OSHA Technical Manual* recommends maintaining an interior building temperature in the range of 68–76 °F (20–24 °C) and humidity levels of 20–60 percent (US Department of Labor, 1999).

## Conclusion

Universally-friendly spaces are well used. Creating such spaces within academic libraries is exciting. Those responsible

for the design of areas within the library are familiar with the overarching building codes that direct the construction involved in the project. Those who understand the standards that determine the durability of specific design elements, such as color, flooring, heating, lighting, ventilation, furniture and security, are better equipped to outfit user-friendly spaces appropriately. The goal of this chapter is not to be comprehensive, as there are many more elements (e.g. fire protection, utilities etc.) not discussed here. Providing the reader with the key aspects that require some level of understanding – even at a basic, rudimentary level – will enable quality spaces to be created for today's users of academic libraries.

# Universal Design of learning spaces

**Abstract:** This chapter explores the concept of Universal Design with respect to learning spaces: effective library design, construction and renovation within the context of understanding how we learn, create and apply new knowledge. The changing nature of the iCommons within learning space design is the "new normal," providing a deeper understanding of the impact of physical environments on teaching and learning. The successful project combines the design of both group and individual study spaces along with innovative cost-effective solutions. Current trends in information literacy and general classroom design focus on flexibility in meeting the various learning styles of students. By exploring the evolving iCommons concept, driven by curricula, assessment strategies and research, information learning spaces can be designed to be used to their fullest potential.

**Key words:** formal learning spaces, group study, iCommons, individual study, informal learning spaces, information commons, information literacy classrooms, learning commons, library design, public space, staff space

## Introduction

Academic libraries are used for a wide variety of activities. The *Whole Building Design Guide* (National Institute of

Building Sciences, 2010) program provides a brief list of uses of academic library space:

- auditorium or larger lecture space;
- collection space;
- meeting space;
- non-assignable space (including mechanical space);
- special use space (e.g. café, exhibit, learning spaces, multimedia production and collaboration spaces, etc.);
- user seating space;
- viewing rooms and listening rooms;
- workstation spaces.

One way to visualize construction projects is from task to overall building and vice versa. Traditionally, library architecture was meant to make users feel like they were entering a structure where they could explore and learn – having a quiet reflective experience. Today, students and faculty venture to the library more than at any other time in history. Given competing venues such as coffee houses, conference centers, resorts, and even cruise ships, library user expectations are high. Users want a transformative experience. If they get this, they will return over and over again. This is why universal interior design is so crucial.

Effective library design recognizes the differences between public use and non-public (or staff) use of space. Public areas include quiet study areas and rooms, group study areas and rooms, presentation spaces, information/learning commons, computer labs, exhibit and event spaces, special collections areas and reading rooms. Use of library space by students and faculty can range from silent to group conversations, from individual research with a laptop to

interacting with multiple technologies. Use of library space by staff for work purposes is different. Tasks can vary from individual work cataloging or searching for information, to organizing collections of archival materials, to digitizing rare books or manuscripts. Applying the same design to both types of spaces fails to address the nature of activities and work in public versus staff areas within the library. Care must be taken to match the use of space with the most appropriate design model.

The best library renovations and new builds think about the library building as a place where using the library itself is intuitive. People can move throughout the building, easily locating what they need to use. Signage, layout, lighting, color selection, furniture selection and placement, ambiance, location of collections and services are created in such a way that traveling throughout the building is effortless. Good design will leave the library user with the impression that the designers (you, your colleagues, the architects, etc.) understood how to build spaces for specific activities within an overall theme or a common framework that is evident throughout the structure.

This chapter highlights key points regarding Universal Design of spaces for formal and informal learning within academic research libraries.

## Universal Design of learning spaces

The design of learning spaces within academic libraries needs to be seriously revisited in light of the way we learn, create and apply new knowledge. Academic libraries and libraries in general have always been places of learning. As the internet and new information technologies became

increasingly necessary to access information, academic libraries developed information or learning commons. (As there is no one universally accepted definition of an information commons or a learning commons, *iCommons*, *information commons* and *learning commons* will be used interchangeably throughout this chapter.)

The first wave of the information/learning commons concept was based on the idea of establishing a "one-stop-shop" of library and information technology (IT) services. Reference, circulation and IT helpdesks were merged into a single information service point. Computers for students were plentiful. Information/learning commons were most often located on one floor of the library, near the entrance for easy access. The model focused on serving students as efficiently and effectively as possible.

Librarians have enhanced the first iteration of the information/learning commons by adding more services (e.g. print-on-demand, self-serve scanning, a business-like media center for multimedia development to be used for presentations, projects, etc.) as well as updating and reconfiguring furniture. Instead of rows and rows of computers, information/learning commons contain computer groupings or pods as well as collaboration stations where students can use multiple PCs, laptops, or other electronic devices connected to a large monitor for ease of viewing, hopefully resulting in improved collaboration. Academic librarians are now eager to create a new generation of the information/learning commons concept.

There is a "new normal" in the design of spaces for learning. The role that academic librarians and libraries play remains the same: to preserve and provide access to our cultural heritage and scholarship (regardless of format) as well as teaching users how to search for, locate and analyze information effectively. Librarians will continue to teach

academic research; assist students, faculty and researchers with their information needs; develop collections of books, journals and electronic resources in specific subject areas; contribute to the scholarship of the profession; design and manage digital resources; integrate new technologies into instruction; and research and work collaboratively with other academic departments to acquire and present information resources and library services needed for teaching and research. What is new is the design of the physical spaces within educational institutions where these activities occur.

An innovative approach to redesigning learning spaces is extensively investigated and shared in *Linking Architecture and Education: Sustainable Design for Learning Environments* (Taylor, 2009). Drawing on her many years as a professor of architecture and planning at the University of New Mexico, Taylor presents a fascinating, refreshing look at the impact physical spaces have on learning. She challenges architects to obtain a deeper understanding of teaching and learning, and challenges educators to know students' learning needs as a whole person as they relate to teaching and learning environments and vice versa. Taylor's progressive, enlightening and new work "is intended to stimulate new ideas in the minds of architects, administrators, [and] educators" who want to make a positive and informed difference in our lives (Taylor, 2009).

## *"Can't learn in ugly"*

So said Gloria Mitchell, a principal from Seattle, upon touring a poorly performing elementary school in desperate need of an extreme makeover. Not all readers will be facing a similar situation at their academic library; some will be looking merely to recast information/learning commons in

a new light. Those who are facing this reality, however, will easily identify with Mitchell's remark. It is a very powerful way of expressing how the design of spaces affects the user's experience. Even though Mitchell was referring to an elementary school, the library, like the school, is a learning environment that must continuously be cared for and nurtured.

According to Callison (2004: 16) the new library is "composed of many small pods for small group work, each with access to online information terminals, video-editing stations and telecommunications for interviews with content experts." The purpose of the present chapter is to share current thoughts on the design of the more prevalent learning spaces located within academic libraries including group study rooms, individual study areas, information literacy classrooms and information/learning commons. Informal learning space possibilities are offered for consideration.

## *Group study rooms*

According to Stewart (2009), academic libraries are "including significantly more group study in new buildings." This is also true in library renovation projects. Some 91 percent of the academic libraries surveyed in this study reported an increase in group study space of more than 50 percent compared with that in their older building; 50 percent reported having between 11 and 29 group study rooms available, with 10 libraries having more than 30. Additionally, Gardner and Eng (2005) discovered that "the demand for group study spaces often exceeds library capacity." Similar demand is also occurring for individual study areas. This is just a sample of evidence illustrating the need for academic libraries to offer group study spaces for students.

So, what is the best design for group study rooms? Numerous design configurations can be found in the literature and on the web. Although there is no "one-size-fits-all" model, there are common elements, including:

- sound proofing to keep conversation contained within the space;
- flexible furniture to move and reconfigure;
- wall-writing surfaces (e.g. write-on/wipe-off boards, write-on/erasable glass, blackboards and/or blackboard painted walls);
- good lighting;
- glassed or partially-glassed walls;
- technology designed for group work;
- straightforward reservation process.

It is important that sound does not bleed through, between and among group study rooms. Installing appropriate sound barriers needs consideration in order to create the correct acoustics. For a good example of a contemporary group study room, see Figure 4.1. Tables and chairs on casters that can easily be moved and reconfigured enable groups of students to work together as they deem most effective. Easily erasable surfaces that can be used to sketch out ideas or work on problems are effective in this type of environment. Good lighting, temperature controlled for comfort, and space entirely or partially walled-in with glass or frosted glass enables students to see and to be seen without disrupting others. Requirements include video projectors, wireless connectivity, sufficient electrical outlets to plug in laptops and other electronic devices, and a large monitor so that students can share their work with the group.

As demand to use group study rooms is so high, it is essential to be able to see easily which rooms are available and then

**Figure 4.1** Glassed-in group study room Abilene Christian University, Abilene, TX, USA

Photo credit: Jeremy Enlow/Abilene Christian University, 2012

reserve one's room via an electronic system. A group of students at Stanford University's Graduate School of Business took on the task of designing the ideal study room (Lynn et al., 2008). In addition to verifying common elements of highly used group study rooms, the students proposed creating "themed" rooms. Observing that group study rooms were monolithic in terms of "bland color and identical layout," this group thought each room could have its own identity, such as a Japanese-inspired study room (Lynn et al., 2008). As demand persists, Shill and Tonner (2003) argue that "group study rooms are 'an essential component' of today's academic libraries" and will continue for some time into the future.

## Individual study spaces

Spaces for independent study within academic libraries are just as in demand as group study rooms. Students still crave

spaces that are silent so that they may concentrate. Today you will find "quiet" or "silent" study areas within academic libraries. "While students are intensely engaged in using new technologies, they also want to enjoy the library as a contemplative oasis" (Freeman, 2005). Silent study spaces are usually designated areas within libraries and can be created with as little as signs saying "silence please" marking an area. As with other library spaces, students expect comfortable seating and good lighting, and to be beverage-friendly and above all, quiet. Available seating can be in a variety of shapes, sizes and types, including task chairs with or without wheels, large comfortable chairs and larger love seats and/or sofas. The ability to plug in a laptop and/or other electronic device next to the seating is critical. Task lighting – lighting that can be adjusted for brightness and easily moved – is of utmost importance as students will be spending a majority of their time reading. Care must be taken in selecting flooring that absorbs sound and color that is peaceful. HVAC systems need to be quiet and set to a comfortable temperature.

Additionally, individual study carrels and tables should not be dismissed as archaic or useless. As long as each study carrel or table is equipped with task lighting, electrical outlets and comfortable seating, students will use this furniture for studying. Carrels are available in all shapes and sizes and are produced from a variety of materials. The stereotypical study carrel made from hardwoods is still available. Carrels with privacy dividers made from frosted or etched glass, Plexiglas, or other material provide students with additional light and decrease the feeling of being "closed-in."

Large academic research libraries frequently offer faculty and graduate students the opportunity to reserve an enclosed

single-person study room for a semester or academic year. In this model, the individual is assigned a key or smart card to a specific space which is usually lockable. When designing or reconfiguring library square footage, take time to survey faculty and students to identify their level of potential use of individual study rooms. As many faculty work on research or grading in locations outside of the library (e.g. homes, offices, cafés, etc.), the request for private-use library space has dramatically decreased over the years. In contrast, students, especially graduate students, appreciate the library providing special spaces for them to study. As with group study rooms, there never seems to be enough individual study rooms to meet student demand. One solution to this challenge is to purchase lockable carts on wheels. Study carts are assigned to each student, similar to checking out a key to a study room. The student wheels the cart to an available space for a certain amount of time and then returns the cart to a secure, central location within the library for easy retrieval next time. This model meets the students' need to secure materials for future use without having to trudge needed scholarship to-and-from the library. It also provides the library with maximum use of individual study spaces as spaces are used on demand as needed.

Students will reconfigure furniture that is lightweight, yet durable, to meet their own individual preferences. Tables on wheels that can be moved apart and used individually, or put together for group work, provide for maximum seating capacity as well as being comfortable for students. The need for individual study carrels and tables continues to be significant. Individual faculty study space is less in demand than was in years past. However, students, particularly graduate students, appreciate the option of being able to leave their work – books, writings, etc. – securely in the library for use when needed.

## *Information literacy classrooms*

Two of the most researched and discussed spaces in academic libraries are information literacy classrooms and information/ learning commons. Modern classrooms are designed to allow for more interactivity. Where traditional classrooms held rows of tables and chairs or desk/chair combinations facing the instructor at the front of the room with a blackboard, screen, maps, overhead projector and other stationary teaching tools to enhance learning, today's learning spaces are designed to be flexible so that a variety of teaching methods can be used. As Freeman (2005) states, the challenge "is to design a learning and research environment that is transparent and sufficiently flexible to support this evolution in use." Adding tables and chairs on wheels, hanging a few large monitors and whiteboards on the walls, and installing extra electrical outlets and calling it effective design sells the process short. As educators, librarians need to "incorporate a deeper understanding of the independent, active learning behaviors of students and the teaching strategies of faculty meant to support those behaviors" (Bennett, 2003).

Academic librarians offer information literacy programs that require extensive use of classroom teaching space. Librarians use various teaching techniques, matching techniques to student learning styles and to intended learning outcomes. Classroom design has developed significantly over time, as knowledge has expanded and deepened in terms of how we learn. Traditional classrooms with fixed rows of tables, an instructor's station at the front of the room, and a student-to-computer ratio of one-to-one, have evolved into furniture and technology that is easily reconfigurable. Figure 4.2 provides an example of a
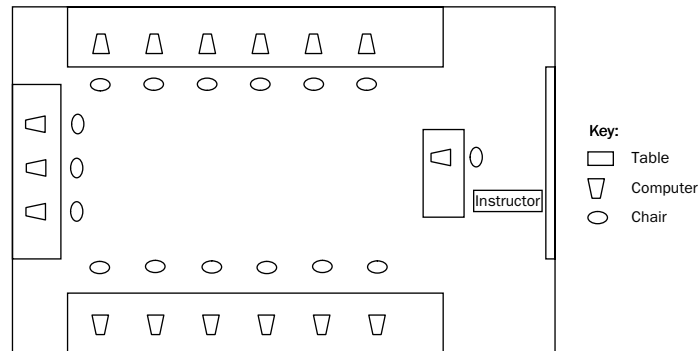
**Figure 4.2**   Traditional classroom

traditionally designed classroom, while Figure 4.3 offers an example of a Universally Designed classroom. In a redesign of a formal classroom located in the University of Iowa's Main Library, Soderdahl (2011) changed the classroom design from traditional to interactive by implementing the following elements:

- seven round tables;
- three students per table and per computer;
- basing the instructor at the center of the room;
- installing easily accessible technology.

Such design enables the instructor to change teaching formats as needed. Three students per table and per computer encourages interactive learning in small groups. Positioned in the middle of the classroom, the instructor is able to move throughout the space to check on students' progress while staying out of the line of sight of information displayed on screens or on the walls. Finally, technology, such as video projectors, monitors, PCs, laptops and other electronic devices can be used in instruction. However, the technology is not the main event that defines the space.
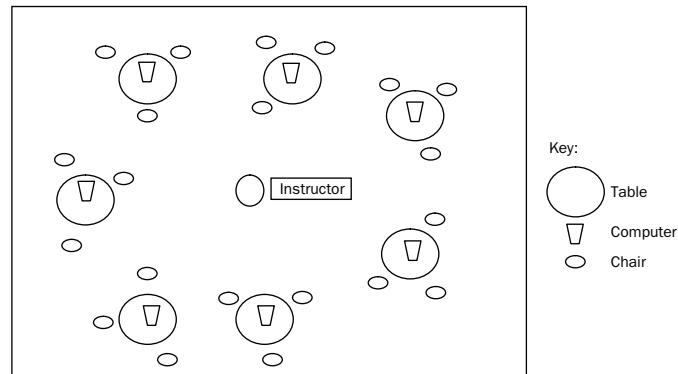
**Figure 4.3**   Universal Designed classroom

A well-designed contemporary classroom looks like an active learning space. Technology, albeit available, is hidden and used as needed.

Design of student-focused classrooms enhances the learning experience with the expectation of increased retention of the skills and content taught. Taylor (2009) offers a vision of future classroom design where educational companies will build classrooms per design specifications offsite, then "drop ship" the entire package into a school, college or library, whereby the company installs a custom-designed yet out-of-the-box upgrade to existing classroom space. Elements in this packaged model might include pre-wired floors that are ready to install; wall units used for storage with pull-out tables or counters and for student lockers; current technologies such as digital cameras, iPads and other electronic devices; "surface intelligent" surfaces – or "smart surfaces" – for creating, developing and presenting information; virtual flipcharts and enhanced video conferencing capabilities, in addition to easily reconfigurable tables and chairs (Wojtas, 2008).

"Poor design can be as simple as a lecture room with the entrance at the front" (Seaman, 2010). Today's classrooms, including classrooms used for information literacy instruction, need to be agile. AIA, LEED AP architect Seaman describes several activities that classrooms might be used for, including one-on-one instruction, peer-to-peer discussion, small and large group interaction, teacher-directed instruction and student presentations. Experienced instructors will tell you that one of the first things they do upon entering a classroom is to reconfigure the furniture. "The first pedagogical choice faculty members make is how to set the room" (Villano, 2010). Contemporary classroom design, as with other library spaces, begins with determining the activities that will occur in the space. Identifying instruction that will occur in the information literacy classroom, maximum student capacity, and frequency of classroom use will drive the type of furniture and technologies selected for the space. Observing actual classes using the space is also infinitely helpful in matching instructional pedagogies with student learning styles and needs.

Current trends in classroom design include furniture that can be repositioned into various formations and technologies that are accessible yet hidden when not in use. Remember that classrooms "are not inert containers or backdrops to curriculum processes, but are active processes *in* process that are understood and experienced in a multiplicity of ways" (Crane and Thrift, 1999).

## *The iCommons concept*

The iCommons concept emerged in the early 1990s. Various terms are used interchangeably with the term "iCommons" including information commons, learning commons, learning

and research commons, and information and research commons. Scholarship in this area further refines definitions of the iCommons model. Beagle (2006) defines an iCommons as "a new type of physical facility or section of a library specifically designed to organize workspace and service delivery around an integrated digital environment and the technology that supports it." Broadly speaking, this definition holds true today. However, there is a movement to expand and/or reshape the traditional iCommons concept.

Walk into an academic library today and you may come across some iteration of an iCommons. Frequently, an iCommons includes the following:

- a joint-use information desk (reference, circulation, interlibrary loan/document delivery, reserves and information technology support);
- availability of various technologies, such as PCs, Macs, collaboration stations, etc.;
- self-service services (e.g. photocopying, scanning);
- easy access to electrical outlets and wireless networking;
- flexible furniture that is easily moved and reconfigured;
- "touchdown" spaces where computers can be used for a quick search or to check email.

Adjacent spaces and services to the iCommons often include:

- a café;
- welcome desk;
- information literacy classroom;
- group study rooms.

In terms of physical space, an iCommons can be anything from an area on a single floor of a library, to an entire

library, such as the University of California Berkeley's Moffitt Library, where each floor has been designed to hold an element of the iCommons concept (see *http://moffitt. berkeley.edu/lookinside.html*). The floors in this library are organized as follows:

- *fifth floor*: quiet commons;
- *fourth floor*: collaboration commons;
- *third floor*: community crossing;
- *second floor*: computing and media commons;
- *first floor*: campus classrooms and internal operations.

Additional iCommons layout examples including estimated costs can be found at *http://libguides.fiu.edu/infocommons*. Here, Florida International University shares progress reports and sample configurations of its planned iCommons.

There is no one-size-fits-all solution to iCommons design. Each library will need to determine the best use of iCommons space in light of student and faculty needs. Curricula, assessment instruments (e.g. research papers, projects, presentations, etc.) and research interests will drive the services and resources offered in iCommons space.

## *Universal iCommons design*

Most academic libraries have implemented an iCommons model of some type within the last 10 years. Rapidly changing technologies as well as local and global events of all kinds (e.g. economic, social, political, etc.) continue to impact the way we learn and work in the world. A movement is just emerging to reconceptualize the iCommons concept on campuses. The traditional iCommons model seems to be morphing into "a full-service learning, research and project

space" (Lippincott and Greenwell, 2011). Essentially, the idea is to create an in-library location where a student can obtain almost any type of academic support that he or she needs. Robertson (2009) distinguishes learning environments, such as the iCommons, from workspaces (e.g. classrooms, labs, etc.) and living environments (residence halls). Learning spaces located within libraries provide students and faculty with "a neutral space outside of disciplinary structures." Abilene Christian University's Learning Studio is a good example of a redesigned entranceway that invites students into the new iCommons space (see Figure 4.4).

In addition to the traditional elements found in an iCommons environment (e.g. multi-service information desk, availability of technologies, self-service business-type services such as printing, photocopying and scanning, and



**Figure 4.4** The new entranceway to Abilene Christian University's Learning Studio

Photo credit: Jeremy Enlow/Abilene Christian University, 2012

flexible furniture), the next iteration of an iCommons might include some or all of the following resources and services:

- a research reference suite where librarians are available to consult one-on-one and in small groups with students and faculty;
- basic multimedia production where students can create as well as practice presentations;
- writing center;
- research development support such as:
  - geographical information services (GIS);
  - statistical analysis support;
  - experimental design services;
  - grant assistance.

A number of academically-centered student support services are important to student development and growth, and represent good candidates for locating adjacent to the iCommons. These include tutoring, testing and career services.

Although predictions about the future use and design of academic libraries persist (e.g. see Sens, 2009; Lippincott and Greenwell, 2011; Myers, 2011), we really do not know what technology and the changing nature of higher education will bring 5–10 years from now. The best design, not only for the iCommons but also for library new builds, renovation and expansion is to develop spaces that can easily be changed with little effort and at a low cost. Sens (2009) recommends focusing on infrastructure (e.g. HVAC, natural lighting and vertical circulation) that can support future changes with minimal effort and expense.

### *Informal learning spaces*

Informal learning spaces are abundant on campuses. Such spaces may or may not have been specifically designed for study and collaboration. However, the space ends up being used consistently by students and faculty to read, contemplate and converse with others. Coming in all shapes and sizes, informal learning spaces are located throughout campuses. Such spaces can be inserted into project design – locating areas both within and outside of the library. Examples of informal learning spaces within the building include alcoves and other "non-essential" space. These types of spaces are found in hallways, off classrooms and built into window sills/bays. The café is a prime example of a planned space where informal learning occurs. Spaces between book stacks as well as the library's atrium (if large enough) are great informal learning areas.

Strategically placed benches, concrete or stone walls, walkways, a gazebo, tables and chairs around the exterior of the library will be well used and greatly appreciated. Campuses have designed bridges connecting buildings with soft seating, tables and chairs, even a café. Some colleges and universities install various water features (e.g. ponds, waterfalls, water walls, etc.), plant flower gardens, place interesting sculptures, as well as softly broadcast piped-in music, much like Disneyworld. The goal is to use space effectively by making areas comfortable and appealing for use by individuals and small groups.

## Conclusion

When creating learning spaces within academic libraries, a good place to begin is to answer the following questions:

- What activities will occur in the space?
- Approximately how many people per day, per hour, will be using the space?
- What is the expected noise level?
- Will technology be used and, if so, what type?
- Will large study/collaboration work space be required?
- When will the space be used – 24 hours a day, 7 days a week or traditional work hours?

Identifying what activities will occur in a space is the first step to effective design. Space could be used for reading and studying or for conversation and collaboration. An area might demand a high level of bandwidth and electrical connectivity or may only need comfortable seating and soft lighting. Depending upon square footage allocations and needs, some spaces will need to be designed as multi-functional, as opposed to dedicated for a specific purpose. The goal for each space, however, is to use the best possible design available at the time of implementation.

# Potential collaborations

**Abstract:** This chapter presents strategies for determining the best collaborators to include within or adjacent to the library building. Examples of successful and failed collaborations including writing centers, centers for teaching excellence, student advisement, and information technology and digital media initiatives provide an understanding of key factors such as identifying the primary service(s) and clientele, expected service hours, fiscal support, staffing, and the sharing of common space when developing partnerships. Good design will consider the logistics of collaboration between various library and related academic services including service points; technology purchase, upgrades and maintenance; as well as handling increased demands by students and faculty on physically co-located services.

**Key words:** centers for teaching excellence, collaboration, digital humanities, digital media, information technology, IT, student advising, testing centers, tutoring, writing centers

## Introduction

More frequently, academic libraries partner with other departments, centers, or entities on campus to share space in the library. As you renovate or build a new library, you might discover that non-library personnel will seek to obtain space within the library building. In some ways this is to be expected as you will be creating a new learning space.

Writing centers, testing centers, centers for teaching excellence, information technology (IT) labs and/or classrooms and others look to the library as *the* place where students congregate. As a result, library-center collaborations are developed in order to better serve students and faculty, especially in terms of saving time by not having to run around campus to get assistance from academics. Inviting other services to reside in the library makes sense where the service coincides with the mission of the library.

Approving new tenants (so to speak) needs careful consideration. Before you jump in and say, "Yes, please join us!" think about how the specific service will either enhance or detract from the goals of the library. For example, having a writing center live in library space is a good choice. With a writing center located within the library, students can obtain assistance from librarians in searching for information as well as working with writing center staff to improve their writing skills – all in one location. On the other hand, having a tutorial service may not work as well, especially if library space is at a premium. Most people would agree that receiving tutoring in math, science or any number of subject disciplines can occur successfully in other non-library buildings or informally within the library building itself. Tutoring in these academic subjects does not require the use of a library; thus dedicating a space to a tutoring center needs careful review, especially when space is limited. Working through a process to select the "best" collaborators will save you time in the long run.

## Determining the best collaborators

Some academic services are a natural fit within a library building. Writing centers and centers for teaching excellence easily come to mind. Testing centers, IT computer labs

and/or classrooms are other services that might be good to house in the building. Here are questions that you should answer prior to committing to moving another service into the library:

- What is the primary purpose of the service?

- Who is its primary clientele?

- What are the expected hours of service?

- Who is responsible, both in terms of planning and financial support, for designing, constructing and outfitting the space with furniture, computers, etc.?

- Who will be responsible for ongoing costs for IT support, telecommunications (e.g. phone, cable, etc.), as well as refreshing, replacing and/or repairing technologies, furniture, carpeting, painting, cleaning and general maintenance of the space?

- Where will support for IT equipment come from?

- When will the service be staffed and who will staff it?

- What happens when the service is closed but the library remains open?

- To whom does the head of the service report?

- Is there the expectation that non-library staff will share library staff lunch space, the refrigerator, microwave, etc.? Or are they to provide their own? If so, does the design of the space allow for these appliances including appropriate electrical hook-up?

These questions have arisen out of many years experience welcoming non-library academic services into the library itself. The questions may seem a little "picky," but they will need to be answered at some point. Of course, resolving

these issues before your guests move in is a good idea. What follows are three examples of different scenarios regarding collaborations in library space.

## Writing center

At a major research university located in the US Midwest, a writing center director approached the library director to ask if the writing center could have permanent space in the library. The writing center was located in a small office in the back of another building on campus that was not frequented by students. Students expressed to professors the clear need for assistance with writing; however, due to the location and limited hours of operation, the service was not being utilized to its fullest extent. The library already housed a graduate writing center specifically for graduate students in a small study room within the library. It was determined that graduate students have specific writing challenges, especially in terms of theses and dissertations. The writing center seeking space in the library was primarily for use by undergraduate students.

After touring the library several times, a space was selected to build a writing center. The space was originally designed for student study. For many years it was the home to library reserves. When reserves moved to the main floor to become a part of access services, the space was vacated. Essentially, the area was considered "dead" space – simply not usable for library resources (e.g. book stacks) or library services.

Although not as large a space as would have been preferred, the writing center director and the library director, working with writing center consultants, designed the space to accommodate three writing help stations that could be used simultaneously. The result has been much more positive than anticipated. In fact, use of the writing center has tripled

since it moved into the library. Students can register online to schedule a time to meet with a writing consultant, or they can walk in. (Sunday evenings tend to be very busy as students use the service at the end of their weekend.) Because the library is open 24 hours a day, 5 days a week during the fall and spring semesters, the hours of the writing center have been expanded. The writing center has provided furniture, computers, a telephone and other supplies, while the library provides the IT support as there are only three computers to maintain. As writing consultants change every 2–4 hours, there is no need for them to use the library staff lounge. Feedback from students and writing consultants indicates a high level of satisfaction with the service and the new location. Librarians are also seeing an increase in the number of students who ask for help seeking information and are also using the writing center. Writing center staff report that they can easily consult a source or ask a librarian for assistance more readily. As the writing center is used so heavily, more space would be appreciated. Unfortunately, the space as presently designed does not leave room for expansion. Figure 5.1 depicts book stack, study areas, writing center, testing center, and teaching excellence center design in an academic library. Overall, however, this continues to be a good collaboration.

## *Center for teaching excellence*

At another academic research university, the library and the center for teaching excellence discussed housing the center within the library. As with the writing center, the center for teaching excellence was located in a building far off the beaten path – in a basement with temporary walls. As such, the center received very little traffic from faculty. Furthermore, as their location did not include a classroom, presentations

Entry into 3rd floor study area and book stacks

Elevator →

Entry to Writing Center and Testing Center

Writing Center

Study area

Library stairs

Stairs to lower level

Testing Center

Study area, open to 3rd floor

Teaching Excellence Center on 2nd floor
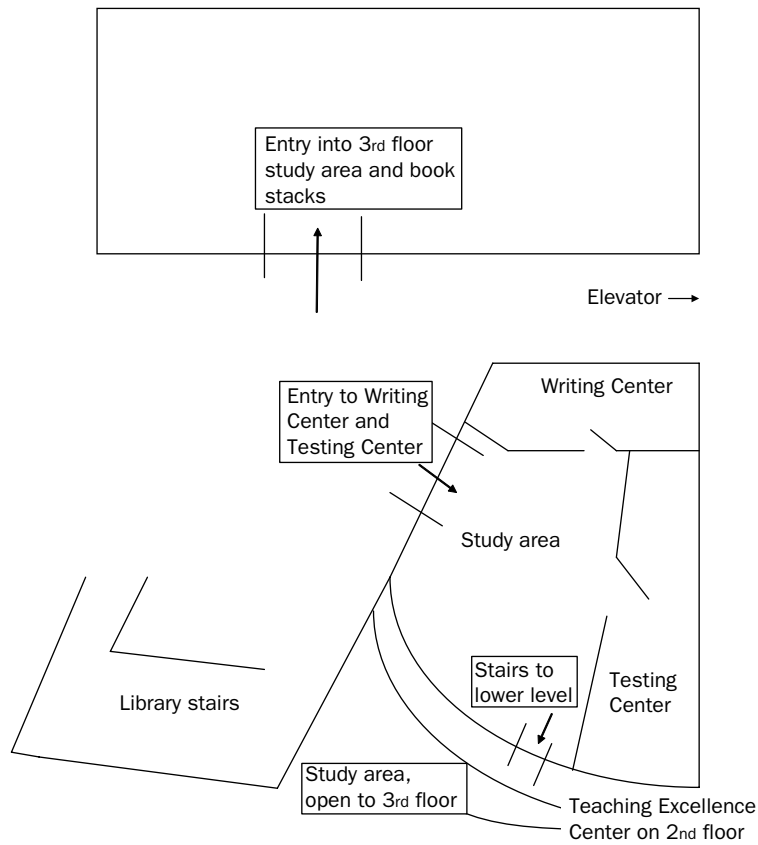
**Figure 5.1**   **Depiction of book stack, study areas, writing center, testing center, and teaching excellence center in an academic library**

were held in the library. This required center staff to move technology, refreshments, handouts, etc. one block to the library every time a presentation occurred.

Library space was located within the building to create a center for teaching excellence. Both the center director and the library director collaborated on the design of the space. Included were offices, a reception area, one-on-one instructional space, storage and a place for a small refrigerator

and microwave. The color scheme used in the interior matched the color palette used by the library. As the space was not large enough to build a classroom, it was agreed that center staff could teach in one of the library's three classrooms, provided that the rooms were not already scheduled for library instruction. Additionally, as with the writing center, the number of computers was minimal, so the library offered to provide IT support. The new location has resulted in a dramatic increase in faculty using the center to learn new teaching and learning pedagogies. The center has become more visible to the campus community. Center staff appreciate being able to extend their hours as the library is open longer hours. In addition, faculty have indicated that they prefer to use the center in the same location as they do their own information searching.

## Student advising

Here is an example of collaboration that was attempted, yet failed. The director of academic advisement approached the library director to offer student advisement in the library. After much discussion, a pilot test was arranged to see if the service was a good match for inclusion in the library building. A group study room located in the library was scheduled in the late afternoons and early evenings. A student adviser was available to answer students' questions about their course schedules, career options and related academic issues. Even with a good publicity campaign across campus, online and in the library, the service did not take off. Students did not reconcile the library with advisement, but rather saw advisement as part of career and student services, which was housed in the student union. After offering this service in the library for two semesters, it was dropped due to lack of use.

## *Information technology and digital media*

Discourse on the challenges and opportunities of combining or co-locating campus IT services and/or digital media services within library space is evolving beyond a "survival of the most relevant" stage. Questions concerning whether or not IT should be organized under library operations, or vice versa; if a central service point offering reference, circulation and basic IT services should be built; and if media services such as self-serve multimedia production, sound production (i.e. for recording podcasts and vodcasts) and creation of visuals in multimedia and print form are well on the way to being resolved. Issues have moved away from a focus on whether they should or should not join the library world, to how these entities can collaborate effectively to provide students with related quality services. Considerations in this realm include both design of the physical space (service points, offices, production space) and the selection of technologies, but also staffing responsibilities. There is no shortage of examples of IT, digital media and academic library collaborations in the literature. The three case studies that follow are illustrative of such projects.

Ohio State University's Digital Union is a case in point. In 2002, Ohio State embarked on a US$100 million library renovation project (Ackerby and Miller, 2004). Project team leaders were interested in moving beyond the concept of new spaces designed simply to be open and flexible, and towards meeting increased student and faculty demand for access to library, IT and digital media in one location. "The mission of OSU's Digital Union was defined as meeting faculty and student needs from idea generation to final presentation, using the research skills of the librarians and the production skills of the information technologists" (Ackerby and Miller, 2004). After beta testing this concept on a small scale, the

Digital Union is now a pivotal place where teaching, learning, information gathering and analysis, and the development of new knowledge occur (see Figure 5.2).

The University of Michigan's Media Union provides a second example of offering related services such as media production, a 3D/Virtual Reality Lab, teleconferencing, wireless connectivity, information resources and library services within the library proper. What is unique about the Media Union is that three very different entities – the Art, Architecture and Engineering Library, the College of Engineering's IT group and the Media Union's digital media and courseware development teams – are co-located in the same space (see Figure 5.3). Outcomes of this project have been nothing less than stellar. Librarians work with the Usability Lab to conduct library web usability testing. Library services, such as electronic reserves, have been embedded into the course management system. Although not without challenges, these student-centered units have a greater understanding and



**Figure 5.2** The Digital Union space at Ohio State University, Columbus, Ohio, USA

Photo credit: David Hooker/Ohio State University, 2012

**Figure 5.3** Studio Master Control Room, University of Michigan, Ann Arbor, MI, USA

Photo credit: Digital Media Commons/Regents of the University of Michigan, 2012

expectation of each others' work (Ackerby and Miller, 2004).

The most recent of these three examples can be found in Abilene Christian University's (ACU) Learning Studio. Supported in part by AT&T, the Learning Studio resides within the library and is designed to get students to learn and create using cutting-edge technologies (Williamson, 2010). Library space was renovated to provide students with an exciting environment within which to create and experiment with new technologies regardless of their skill level. In the words of Kyle Dickson, Associate Professor of English and Director of the Learning Studio, "Students often just need a place to get started." Opened in 2011, ACU students and faculty now have access to a high-end recording studio, collaboration rooms, a presentation center, and new space for the library's media collection.

### *Other possibilities*

Although writing centers, centers for teaching excellence, student advising services, IT and digital media production are highlighted here, in reality, opportunities to collaborate with other entities within the library building are endless. Almost all academic libraries have cafés, whether run by the library, university or an outside vendor; centers for digital humanities whose staff work with students and faculty to use and develop new virtual realities, 3D imaging and other yet-to-be-developed capabilities that enhance our understanding of text, oral and visual communication; testing centers where students can take missed exams and can conveniently study until the last minute; or art installations (permanent or temporary) with faculty, student and outside-of-university artists – used not only for viewing, but also in learning about art history, painting techniques and so forth. When it comes to sharing space, collaborations work best with those whose missions, goals and values are aligned with those of the library.

## Conclusion

Today, sharing library space with other academic units or non-university agencies is expected. Increasing real estate and construction costs coupled with the rapid changes in how we create, store and deliver information make co-location of related services within the library both desirable and achievable. Moving print collections to accessible storage, downsizing our microform collections as this information moves to the online world, replacing older and frequently larger technologies, such as microfilm reader/printers, with small devices, such as laptops and iPads, usually frees up large amounts of square footage within the library.

Certainly open space is needed for reflection, research and study. Such space should be made available as it makes a significant positive impact on learning and the discovery of new knowledge. Carefully planning, co-locating and/or combining related services, such as writing centers and media production, with information resources and library services provides students and faculty with a single location where they can explore their areas of interest by seamlessly moving from one service or resource to another. If you think about it, this is a student or faculty member's dream come true. Being able to learn, create new knowledge and develop multiple methods of communicating this newly discovered information to the rest of the world, with the latest technologies, and, most importantly, with librarians and staff who are experts in facilitating their research all in one location is probably *the* primary activity that most students and faculty expect to experience in academe.

# Transforming spaces through the use of vignettes

**Abstract:** This chapter provides the reader with an understanding of the concepts of Universal Design as they are practically applied to real-life scenarios. Case studies are used to demonstrate the importance of rules, regulations and standards that apply to Universal Design, as well as the importance of Universal Design in creating user-friendly spaces. The chapter provides a number of vignettes, or scenarios, of academic library spaces that are in need of renovation or have been identified as new spaces within which library services and/or information resources are to be made available. Scenarios including recreating the reference desk, meeting increased demand for group study rooms, replacing flooring in a high-traffic area, reinventing staff space, and a new approach to designing social and learning spaces are given as examples of opportunities to apply principles of Universal Design. Each scenario includes a summary of the issue, explanation of relevant Universal Design principles, and suggested actions and processes. Identification of key issues, data gathering and concept planning to meet specific user needs are all key to success in addressing each challenge.

**Key words:** information services, reference service, scenarios, student needs, Universal Design, vignettes

## Introduction

This chapter provides the reader with an understanding of Universal Design as it applies to designing, creating and

reinventing spaces within academic libraries for the purpose of providing effective teaching, learning, research and study environments for today's students and faculty. Learning about rules, regulations and standards that apply to Universal Design is just as important as understanding why Universal Design is critical in creating user-friendly spaces. Chapter 6 provides a number of vignettes, or scenarios, of academic library spaces that are in need of renovation or have been identified as a new space within which library services and/or information resources will be provided.

Actions or processes that can be implemented to alter the space using Universal Design principles are given after each brief story. Learning how Universal Design can be applied in all academic library settings is facilitated through this offering of scenarios, actions and processes. The scenarios are based on real-life situations. Actions and processes are suggestions to implement Universal Design effectively in academic library construction and/or renovation projects. Certainly other decision-making activities and processes can be applied. Those offered here are workable for the situation given.

## Vignette 1: the reference desk dilemma

A reference desk in a medium-sized academic library has not moved its location in 25 years (see Figure 6.1 for a view of the reference service area prior to redesign). The librarians have made some changes to providing reference services to students, including answering questions via email, chat and through their online Ask A Librarian service as well as implementing a triage model of service. In the triage model, trained para-professionals have scheduled reference desk hours. A librarian is always on call to handle more difficult

Ready reference books

Reference desk

Study tables with hardback chairs

Computer workstations
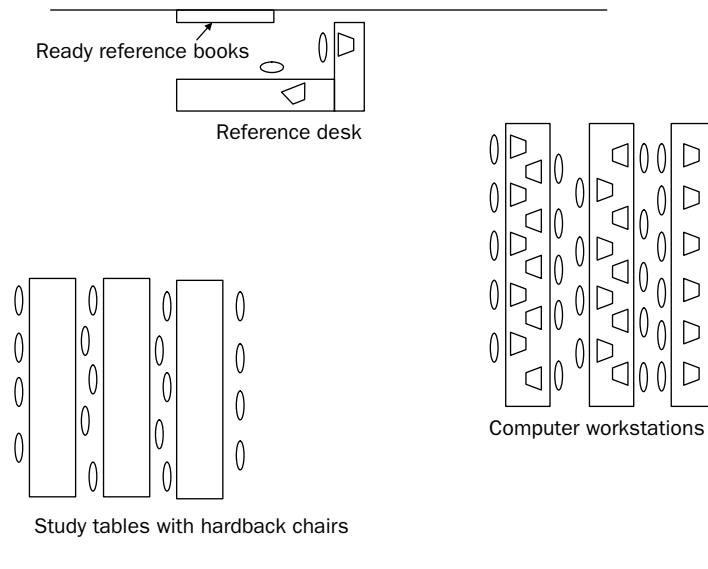
**Figure 6.1**    Reference service area prior to redesign

and complex questions. Assessment of how, why and when questions were being asked has revealed the following:

- the use of online reference services by students has risen dramatically over the past few years;

- librarians are scheduling one-on-one reference consultations with students much more than in previous semesters;

- in-person reference questions at the reference desk have decreased significantly;

- the reference questions being asked are directional (e.g. where is x located?), technical (e.g. how do I print out my paper?), or brief informational (e.g. when is the next tour of the library?)

With resource support from the college administration, the reference team is looking to update the service, including redesigning the layout and elements of the reference area so that it better meets the needs of today's students. The goal is to have the reference space redesigned within the next six months.

## Actions and processes

The reference team in Vignette 1 has an excellent opportunity to enhance user reference services by designing the space using Universal Design principles and practices. Although the action steps and implementation processes available are many and varied, the suggested next steps coincide with the goal of creating an inviting and effective information research service for their primary user group – undergraduate students. Although all of the seven principles of Universal Design listed in this book are applicable to this scenario, the two most important are principle 4: developing designs that communicate information effectively and principle 7: providing optimal size and space within the design so that it can be navigated by people of all sizes and abilities.

Having analyzed the current state of reference service provided, the team would glean additional useful information by:

- *Way finding*: Observe the various points of access to the reference desk from other areas of the library. Is the reference desk located in a prominent location so that it is easily recognizable upon entering the building? If not, do signage or other visuals identify a clear path to the area? Or, upon entering the library, do users go to the circulation desk first?

- *Observation*: Observe reference desk activity at different times of the day and different days of the week. Notice how users approach the desk and interact with the reference staff.

Do they stand? Is there a place for them to sit? Do they appear comfortable (sitting or standing) when interacting with staff? Is there a place for the user to set down a backpack and a laptop? Does the staff member appear comfortable answering the student's question? Do they lean over the desk? Do they need to swing around a computer monitor to provide information service? Is the space crowded with people and things (e.g. papers, electrical cords, phones, printers, scanners, etc.)? Or, is the desk designed to provide for a more confidential reference interaction?

- *Visualization*: Take photos of the space you want to refresh and photos of the kind of space you desire to create – gathered from site visits or located online. Post the pictures side-by-side so that you and your colleagues – and students – can compare the images.

- *Surveying*: Conducting a brief online survey of student needs and expectations will provide insight into when, where and how reference services would be most useable. Open-ended survey questions along with some multiple choice and/or ranking questions usually yield applicable information. For example, one might ask "rank each service listed below in order of usefulness to you, with number one being your first choice and number five being your last." Service options might be: scheduled in-person consultation with a librarian; walk-up in-person service; email; ask a librarian online; text; or phone.

- *Analysis*: Upon completion of the reference service assessment, the team will want to gather all of the information obtained and analyze user preferences while viewing the images of the current space and the images of the preferred reference areas. It is at this point the team can discuss service improvement through the eyes of the students. Recall from previous chapters that today's

students – the Millennials – text, social network and call or video chat/Skype to communicate. This generation's upbringing was usually heavily scheduled and regulated by parents, so scheduling uninterrupted time with a librarian may be preferential to walk-up service.

- The team will also want to keep in mind the following factors of universal design:

  - Public service points, such as reference, should be easy to locate within an inviting and welcoming space.

  - The reference desk (now frequently known as the "information desk" or "reference and research services") should be designed to be usable by anyone. This can be accomplished by having the counter at various heights so that it can be used while standing or sitting in a chair or wheelchair.

  - The design should incorporate elements to provide a place for a confidential reference interview – confidential in as much as can be created in an open environment. Screens, tack boards, frosted glass, frosted film on glass, or other materials can be used as counter dividers so that staff and the user can have some semblance of privacy.

  - Each interaction of sharing information and/or providing individualized instruction can be addressed with a large computer/flat-screen monitor on a swivel-mount so that it can be positioned to share with the user, or by installing two monitors – one placed in front of the student and the other in front of the staff member. In this design, staff can then "take over" the student monitor, providing information and instruction on the student's screen. Additionally, companies are now manufacturing touch-screens embedded in tables so that both the student and the staff member can view and work with

information as it lies flat. Touch-screens make it easy to reduce or enlarge images, to open and share multiple browsers and other software applications simultaneously, view video, manipulate data, change the viewing landscape (vertical or horizontal) and much more.

■ Design elements and style of the information desk need careful attention and vetting. In selecting materials, colors and textures, for example, consider the following:

– Does the library and/or entire campus have a color or style theme? For example, US colleges and universities tend to have their own specific colors – Stanford's colors are cardinal red and white, Harvard's color is crimson and the University of California Los Angeles (UCLA)'s colors are blue and gold. Using a basic color scheme in Universal Design helps users to identify with the campus.

– In the absence of institutional colors, selecting an enduring color palette for the library is not to be dismissed in favor of trendy colors. At present, for example, many US campuses with new or newly renovated buildings, including the library, are opting for a retro color scheme of orange, brown and green – in all available hues. The question to ask is whether your color selection will look as fresh five years from now as it does today? Remember also that resources to refresh institutional spaces are not plentiful, so new furnishings, designs and color palettes may have to last 5–10 years, or even longer.

As with all design projects, creating a visual concept of the space including color, furniture, lighting and flooring selections would be the next step. Using accurate measurements, develop visuals of the space from different angles, then share these with students, faculty, librarians and library staff to obtain input. (See Figure 6.2 for a depiction
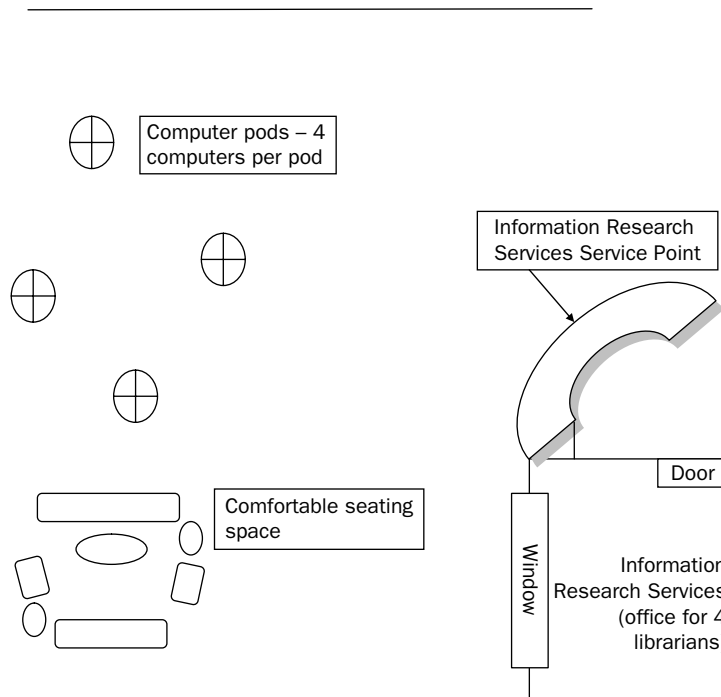
**Figure 6.2**   Reference area after redesign

of the reference area after redesign.) Purchase, delivery and installation can proceed once the specific elements and location of the design have been confirmed.

# Vignette 2: meeting the demand for group study areas

A large, major research university is in the process of adding a significant number of group study rooms and spaces as requested by students. Through a survey of campus buildings and comparison of the number of group study rooms peer institutions have on their campuses, it was discovered that

although some buildings, such as the Business School building and the Sciences building, have group study or "break-out" rooms, use of these rooms is limited to students majoring in their respective disciplines. Additionally, even though the university has three different subject-specific libraries (i.e. art, music and social work), as information has become increasingly electronic, these have effectively developed into reading rooms that offer onsite research assistance from librarians. The music library has "sound listening" rooms for music students to listen to recordings for courses, but the art and social work libraries have no rooms for student group study. However, the main library at the university has some older music listening rooms, small rooms formerly used for typing on typewriters, a few group study rooms scheduled by the registrar for seminar classes due to the lack of classroom space on campus, and two actual group study rooms that need refreshing in terms of paint, furnishings, lighting, electrical, internet access, wireless access and updated technologies, such as large flat-screen monitors. The goal is to create as many group study rooms as feasible in the main library for use by students.

## *Actions and processes*

This scenario is quite common in today's academic libraries – not only major research universities, but college and university libraries at all levels, including community and other two-year colleges. Assigning group projects to assess skills and knowledge is commonplace throughout higher education. This is primarily in response to corporations, government agencies and other workplaces where teamwork and group decision-making and problem-solving are the norm. As such, there is strong student demand for places on campus to study or work together on course projects.

Designing group study spaces for student use is challenging. One of the unknowns is how many group study areas are sufficient to meet today's needs as well as future needs. Assessment of group work as a way to measure mastery of skills and knowledge for a course may be a long-term phenomenon, or may evolve to a way of assessment that does not require such spaces. Music listening rooms offer a case in point. For decades, students would listen to recordings on LPs, CDs and reel-to-reel tapes in specially designed sound-proofed rooms, usually located within a library. With the advent of music downloads and the ability to listen to music anytime, anywhere via portable electronic devices, the dedicated music listening room became obsolete. The same holds true for rooms that were designed for students to type papers using first manual, then electric typewriters. Computers and word-processing software, as well as various other information technologies, make the typing room obsolete. Looking at the past to predict the future, the best advice would be to keep changing technologies and teaching pedagogies in mind when constructing group study spaces.

Several important actions taken at the beginning of the group study space design process will save those involved time and money. Understanding Universal Design principles relevant to constructing space for a number of individuals to use will enable the final outcome to meet the needs of a wide range of students. Of particular note are Universal Design principles 6 and 7. Making sure that the design can be used by anyone with minimal physical and mental effort (principle 6) and providing optimal size and space within the design so that it can be navigated by people of all sizes and abilities (principle 7) will guide the planning team in determining room/space size; easily moveable, yet sturdy furniture; as well as appropriate technologies that can be reached and used with as little effort as possible.

Selecting the individuals to be involved in this design process is important if the design is to be effective. Faculty, librarians, students, information technologists, experts in teaching and learning, academic support services such as tutoring, and those involved with teaching effective study skills will each have a particular perspective on group study room design. Combining practical expert and student perspectives will yield usable space.

Having determined how many study rooms are available across campus and the limitations of each room, the group study room development team should dig deeper into study room use by collecting such data as:

- square footage of each room;

- number of people that can work comfortably in each room;

- room construction (e.g. average room temperature, level of sun/light glare, whether there are any windows, and if so, the size and number, etc.);

- room configuration (e.g. furniture, information technologies, whiteboards, etc.);

- frequency of use (e.g. by time of day and day of the week);

- length of use (e.g. mean/median number of hours each room is used);

- number of hours the building is open for student use per week;

- the last time the room was refreshed (i.e. new furniture, updated technologies, etc.).

Analyzing data can help to inform the design team in determining what is available on campus and working for students in terms of functionality of group study space;

which rooms are not working but could be refreshed to come back online; and which rooms should no longer been used as group study rooms.

Of course, such quantitative data tell only part of the situation on campus. Site visits provide a wealth of information about how other campuses have addressed the demand for group study space. To obtain a sense of where the college or university stands in terms of group study facilities, it is useful for the design team to compare the hard data they have collected with the data of peer institutions. Other key indicators to review include seeing how group study spaces are configured within and outside of the physical library building; comparing various sizes of rooms; obtaining feedback from students and librarians as to the usefulness of the options offered; investigating the types and currency of technologies in place; and understanding the room reservation system, including whether the registrar is able to reserve rooms for seminar use.

A review of the literature regarding current trends in designing group study space for college and university students, studying the "best-of-breed" in terms of award-winning designs and surveying students to determine their group study space needs will round out the assessment process.

As the concept planning of group study spaces begins, the team should be aware of the following challenges involved with the development of such spaces:

- Group study areas do not always need to be rooms. Libraries and other areas within academic buildings frequently have large, open spaces where students can rearrange furniture to meet their study needs. A combination of task-type chairs, large tables, tables that can be split into smaller sections or combined to make one large table,

comfortable seating with side-tables, as well as wireless connectivity and easy access to electrical outlets works well. Lighting should be such that computer screens and text can be easily read, and the group study space should be located some place where noise is not an issue.

■ Group study rooms do not need to be monolithic in terms of size, contents, color and design. As the common saying goes, "variety is the spice of life."

– It is acceptable, indeed encouraged, to use a complementary color palette. For example, if you select blue as the base color, study rooms could be designed with various shades of blue (e.g. light, medium, dark), the painting of an accent wall and so on. Rooms do not need to all be bland beige with light tan furniture.

– Depending upon the results of the data analysis, rooms can be sized for groups of 3–4, 5–7, or 7–12. A group study room that holds more than 12 people is more of a conference room than a group study room.

– Not all rooms need to be equipped with the same technologies. Some rooms can be deemed technology-intensive with all the latest and greatest electronic gadgets available; or technology-enhanced with a large flat-screen monitor and video display unit; or technology-basic with only electrical outlets and wireless connectivity.

– Consideration of how the walls of the study rooms will be used is necessary. For example, whiteboards or walls painted with whiteboard paint are commonly used when studying. Windows and glass walls that can be used to write on and erase are becoming increasingly popular. Some students still enjoy working on a traditional blackboard with chalk rather than on

whiteboard material. Each has its pros and cons. Chalk dust is problematic in terms of air quality, and can easily become lodged within sensitive technologies; nonetheless, chalk is easily erased. Conversely, whiteboards do not suffer from the dust issue, but can be difficult to erase completely. There is also the issue of damage if someone mistakenly uses a permanent marker or pen on a whiteboard.

– In addition to how the walls of the study rooms will be used is the related issue of glass windows and/or walls. A room without windows will be quite claustrophobic for the users. Inability to see in or out of the room is a security issue as well as a barrier to determining the availability of the space. Full or partial glass walls or windows enable students to see and be seen by others. Whether or not to cover the glass is something that will need to be determined. Many people prefer not to work in completely clear glassed-in spaces as this can be likened to working in a fish-bowl where everyone can observe what is happening. Installing blinds that can be open, closed, or half-closed is an option. Blinds can of course break, so a budget for replacing damaged blinds will need to be established. A good solution is to use partially frosted glass, or the less expensive frosted glass film that is applied to the glass. The film can cover a portion of the glass (top, middle, bottom) or can be applied as progressively larger or smaller strips. The latter design enables people to see in and outside of the room while enjoying a sense of privacy at the same time.

■ Sound control is a significant issue with group study rooms. Installation of appropriate acoustical materials is critical in stopping sound-bleed between and outside of

group study rooms. A good way to determine how sound carries is to have one group of team members or students work in one room, another work in an adjoining room, and still another located outside of both rooms. Any sound issues will be immediately detected using this method.

- Determining if a room reservation system is needed will depend upon the demand for use of group study rooms. In addition, the level of demand will dictate whether the reservation system is manual or electronic. Libraries with more than ten study rooms are using electronic reservation technology systems with some degree of success. Electronic reservation systems are preferred when students use smartcards to enter buildings. Libraries with a smaller number of group study rooms and/or that still use regular keys to lock rooms could get by with using the circulation module in an integrated library system by "checking out" the room to a student for a specific period of time. With this method, the student receives the room key with a barcode so that it can be easily recorded when returned. Of course, some campuses elect not to lock or reserve group study rooms, but have a policy of first-come, first-served.

Addressing student requests for group study rooms is a balancing act. Site visits to academic libraries throughout the USA reveal that student demand is always greater than budgetary and space limitations can accommodate. With greater flexibility in design – itself a Universal Design principle (i.e. moveable furniture, technologies that can be easily replaced, moveable walls, etc.) – one can better satisfy the demands of undergraduate and graduate students involved in group study and projects.

## Vignette 3: replacing the 40-year old floor

A mid-sized academic library located in the center of campus urgently needs to address the problem of flooring in the library entrance because it has become a hazard. Installed 40 years ago, the original flooring material was slightly "pebbled." This pebbling enabled people to walk on the floor with confidence and without the fear of taking a spill. Over time, the pebbling has worn down to the point where the surface is almost as smooth as glass. The result has been an increase in the number of individuals falling, the inability for those on crutches or in a wheelchair to navigate the floor as well as for library staff to move book carts to-and-from the circulation desk to the book stacks or technical services. Knowing that flooring is expensive, the library director and access services staff have begun to explore options for replacing the flooring in the entrance to the library, including in the area located in front of the circulation desk.

As options have been discussed, the need for consensus has emerged. Comments and suggestions have included:

■ a floor that makes a statement – something splashy that shouts, "you are now in the library!";

■ an inexpensive floor comprised of linoleum tiles – each of which could be individually replaced as they become worn;

■ flooring comprised of a rubber-like material that "gives" as you walk on it;

■ a tile floor with the university's logo set within it;

■ cork flooring as it is now in fashion and it dampens noise;

■ some type of carpeting as it is not too expensive and is easily replaceable.

All these suggestions are interesting and relevant. However, discourse needs to focus on the topic of universality, discussing such questions as:

- What type of flooring is the safest to walk on?
- Can the material be easily navigated for those using physical-assistive devices, such as a wheelchair or crutches?
- Is moving book carts – both empty and full – effortless?
- Can the material be cleaned using reasonably priced "organic" products?
- Is the flooring composed of durable material?
- Will the floor look the same in five years as the day it was installed?

Carpeting may initially be the least expensive option. If one considers that the first floor has not been replaced for four decades, however, the likelihood of the new floor being replaced in the near future if it becomes worn or ruined is low to zero. Used in libraries throughout the 1950s, cork flooring was thought to be the best material to dampen noise throughout the library. Unfortunately, over time, cork wears down to the point where it is quite smooth – essentially losing its elasticity and thus ability to dampen sound as well as becoming too smooth to traverse safely.

The first Universal Design principle that the library director and the access services staff need to consider, that of designing products, spaces and buildings that can be used by as many different individuals, with varying degrees of physical and mental challenges, as possible, should guide their selection of flooring material for the entrance to the library. Next steps in their quest for the ideal floor-covering solution would include:

- observation of people walking across various types of flooring in different libraries;

- conversations with librarians and library staff who have recently installed flooring in a similar area of their library, including why certain flooring was selected and other flooring was rejected;

- discussion with a flooring expert – one with experience selecting and installing flooring in libraries, educational institutions, or other buildings with high-traffic areas;

- laying large samples of the flooring materials under consideration in the area where the floor is to be replaced in order to walk on them as well as see how the floor covering fits within the overall design of the library building.

Through this process it is hoped that the library administrator and their team will find flooring applicable to their situation.


## Vignette 4: reinventing staff space

A branch library of a university is moving into larger space in another building. The blueprint of the space in the building is significantly different from where the branch library is currently located. At issue is how to design the access services desk so that it both meets the needs of library users as well as streamlines the workflow of staff. The branch library renovation team is comprised of the branch library director, the main library director, representatives from each of the branch library's departments (e.g. technical services, reference, information technology, etc.) and both a faculty and student representative. The new space is such that there is potential to combine the reference and other access service operations (e.g. circulation, interlibrary loan, reserves) into a single service area.

Combining multiple formerly separate but relatable services into a single location is challenging. The final outcome is dependent upon campus culture and politics, the willingness to change and try something new, along with patience to work through the process. Setting aside politics and campus culture, this team will need to decide on the best configuration of furnishings, technologies, lighting and service points that will meet the variety of needs of all library users.

All principles of Universal Design apply to this scenario. Much work will need to be done to achieve the most effective design in the new branch library space. In addition to site visits to libraries that offer access, reference and IT services in a similar manner and reviewing best practices, this team is advised to conduct a thorough workflow study for each service and determine how the results apply in this new setting. A workflow study is time-intensive, but will save a tremendous amount of time by reducing the likelihood of having to change the new service area once it is constructed.

## Actions and processes

At the most basic level, a workflow study involves observing job tasks and documenting each step in a task as it is completed. For example, determining the workflow of processing an interlibrary loan (ILL) book that has been returned so that it goes back to the lending library would involve mapping each of the following steps, including the staff member's movements and equipment used:

1. Retrieve ILL book from circulation book drop.
2. Pick up book with left hand.
3. Turn left and place book on counter.
4. Move right and check-in book with desktop computer using the mouse and keyboard while standing.

5.  Pick up book (either hand) and turn left; carry the book to the return shelf located perpendicular to the circulation desk.
6.  Shelve book in appropriate location.

Another method of documenting a particular task or tasks is by videoing a process and/or processes (e.g. circulation, reference and IT help) that happen on a daily basis. Analyzing how staff complete various tasks throughout the day at the access service, reference and IT service areas will enable the team to understand how current job responsibilities are carried out and identify potential challenges that might occur in the new space. Once current practices are documented, staff that will be working at the combined-service information desk and in the shared space can pilot-test their movements and interactions by creating a mock-up of the new area. All that is needed for this exercise is a measuring tool, such as a measuring tape and colored or other type of sticky tape. Staff that will be working in the new environment can then role-play their daily activities simultaneously by using the exact space which has been mapped out according to specific measurements of each piece of furniture, equipment, book shelves and so on. This exercise will uncover possible issues with providing effective access, reference and IT help services in a single location, enabling pre-planning to occur before furnishings are ordered and installed. It might also uncover opportunities to implement Universal Design practices where one type of furniture (a counter with particular dimensions, for example) can be used by all, instead of creating separate workspaces and then somehow meshing each into the new area. Designing the new information service area by following Universal Design principles will significantly enhance the library user experience.

## Vignette 5: don't over-design social and learning spaces

The primary purpose of Universal Design is to create spaces that meet the needs of as many people as possible. Barriers to use need to be minimized. Users should be able to navigate the area easily and intuitively. Sometimes there is a tendency to design everything in a space, leaving little room for flexibility. For example, constructing walls, even half or three-quarter walls, to segment off a space within a large room will incur the costs involved with demolition and possible renovation/reconstruction in the future. Installing permanent walls, furnishings, technologies, etc. significantly limits the functionality of a space and makes it challenging to change the area when situations require it to be repurposed at short notice. The solution, here, is to not over-design social and learning spaces within academic libraries, but essentially to do the opposite – that is, use various Universal Design techniques to develop zones of use or to establish the opportunity for users to self-design various zones in large spaces.

A case study of the Pilkington Library at Loughborough University provides an example of this challenge (Bryant, Matthews and Walton, 2009). Similar to most academic libraries worldwide, the library found itself having to develop space to meet the needs of the modern university student. Following the approach used by Gibbons and Foster (2007) at the University of Rochester and by the Ethnographic Research in Illinois Academic Libraries (Asher and Duke, 2010), researchers at Loughborough set out to observe the uses of space that formerly housed the reference and other collections on fixed book stacks – a space located near the main entrance of the library. Relocating materials resulted in a large open-space plan

named Open3. Through thematic analysis of field diaries, researchers uncovered very interesting findings.

Instead of determining specific zones of activity by installing stationary walls, furnishings and carpeting, the elements of Open3 were loosely constructed (Asher and Duke, 2010). For example, the space included both long and short-study tables, quick-stop technologies to check email or print off documents, study pods with technologies for long-term searching, and various transitional spaces where users could meet, talk on the phone, or chat with friends. It is also conveniently located next to the café. So how does this work in terms of Universal Design?

In short, it was observed that those who made most use of the space (undergraduates) tended to repeat certain behaviors, including self-governing of the activities that occur in Open3. Asher and Duke (2010) recorded the following behaviors:

- Students would opt first for unoccupied tables, before sitting down at a pre-occupied table.

- Students focused on studying for a long time tended to select tables at the back of the room next to the windows. Windows provided more light and a view to the outside. Furniture was equipped with electrical outlets enabling the use of laptops and other electronic devices. This area of Open3 tended to be the most popular.

- Students used the space for individual and group study as well as working and socializing at the same time. In this study, it was discovered that students do not separate coursework from talking with their friends. These activities are performed seamlessly.

- Behavior in Open3 is self-governed by the users. The overall noise level is kept low and those who need to talk on a cell phone tend to leave the space and move to one of the transitional spaces so as not to disturb others.

The lesson that can be learned from this final vignette is that principles of Universal Design focus on developing spaces that are flexible and useable by many types of people. However, design does not mean that one needs to over-design, dictating where each specific element is to be placed and anchored down. Those who use spaces where a variety of options are available in terms of different types of furnishings, technologies, lighting, etc. can and will self-define how that space is used. As Asher and Duke (2010) suggest, the Open3 approach may be the next trend in developing effective academic library space that can be used by various types of individuals.

## Conclusion

The purpose of this chapter is to provide commonplace challenges faced by information professionals in higher education and suggestions for how to address these challenges through the application of Universal Design principles. There is most likely not an academic library in the world that has not had to reinvent its reference service, particularly points-of-service, in its library building. The trend for the past several years, at least in the USA, is to design as many group study rooms as the library is able to handle. Numbers of group study rooms range from fewer than five to more than 30 at the college and university level. Almost all libraries have needed to replace floors – a task rarely completed more than a few times over a decade. Library renovation, expansion and new build frequently impacts staff workflow, often requiring a rethinking of how and where like-services (such as circulation, reference, interlibrary loan and IT support) are offered. In addition, traditional

iCommons spaces are now being reconsidered in light of student study and research behaviors, including a rise in the use of various portable smart technological devices. The result is a need to meet changing student behaviors by creating environments useable by a wide range of individuals and for various learning and social activities. Here, the upcoming trend seems to be one of using the principles of Universal Design for flexibility of use with the caveat of avoiding over-designing.

# Conclusion

**Abstract:** Chapter 7 provides a summary of the text. It also enumerates challenges in meeting the changing needs of faculty and students; provides various trends impacting academic library design; describes strategies for effective planning; and explains the continuing relevance of libraries in higher education today and into the future. Specific "take-aways" from this text are provided for the time-crunched reader.

**Key words:** changing role of academic library spaces, information technology, IT, planning, relevance of libraries, return on investment, trends

## Introduction

Academic library design, especially interior design, has changed significantly over the years. Once libraries were constructed to hold books and provide users with a place to read and study. A trend began in the 1990s to renovate libraries to increase the effectiveness of providing library services and information resources to students and faculty. Co-locating heavily used services, such as reference, access services and IT support onto the main floor and/or in high-traffic areas so as to enable library users to obtain needed information services in one location became the standard. However, in recent years, there has and continues to be, a significant focus on designing library spaces to meet the

needs of today's and future students and faculty. An understanding of learning theories and models of effective teaching and learning space design is necessary to create user-friendly areas.

Revitalizing library space or building a new library is premised on Universal Design whereby the activities expected to be performed in a space drive its configuration. Even though it is impossible to say what the future will hold, library space needs to remain as flexible as possible for future uses. "While there is a long tradition to draw on, there is no agreed-on paradigm for the library of the future" (Hartman, 2000). However, constructing with the ability to reconfigure library space – whether it be by students moving furniture to meet their needs or more decidedly as modes of learning and work styles evolve – will provide the institution with a greater return on investment.

## Challenges

Our world – the way we work, learn and live – is changing rapidly and continuously. Traditional five-year strategic plans have been reduced to three-year plans or less. New technologies arrive on the market daily. With each information technology innovation comes the need to re-examine and rethink how to better meet student and faculty needs. This is extremely challenging for several reasons.

Higher education administrators are demanding what the return on investment will be once the library is renovated, expanded, or built new. Most renovation or other construction that makes a significant impact on the user's experience will start in the five-figure range and above (US dollars). Although lesser-cost projects can have a positive impact, projects estimated to cost over $10 000 will be scrutinized

for efficiency and impact – efficiency in terms of reducing energy and other building maintenance costs and impact in terms of student learning and faculty productivity. In today's world, it is not sufficient to argue solely that the library has not been changed in x number of years or that improvements need to be made in order to improve library services. Demonstrating that updating the library will improve student learning, increase retention, provide faculty with needed scholarship and research, and greatly assist in enrolling new students to the institution are persuading arguments that can be used effectively to obtain funding and stakeholder support for your plans.

Some on campus will question the role and need of libraries in today's society of electronic information. It is good to question any role or need as it provides us with the opportunity to explain who we are, what we do and the environment needed to be effective. This question is easily answerable in several ways:

- Information comes in a variety of formats. Print is just as important and sometimes more so, depending upon curricula that the library is expected to support. Disciplines in the humanities and social sciences are prime examples of academic programs that still rely heavily on print sources of information.

- Not all information will be converted to electronic format. There is just too much information in the world for this to be a realistic goal or expectation.

- Part of an academic library's role is to preserve and make accessible rare and unique materials. Frequently, a library is the only place to find a specific manuscript or diary. Yes, this information can be digitized, but the original item needs to be preserved. Digitization, at this time, cannot capture the texture of the vellum or the impressions

**125**

made on paper by the author using a writing instrument, such as a pen, pencil or quill.

- Library use by students is at an all-time high. One would think that, with the ease of obtaining information, students would not even consider using the building. However, students will tell you that they enjoy studying among the books and being able to work on group projects with their friends, and appreciate getting help with researching papers and projects. As one student recently expressed, "When I go to the library, I go with the intention of studying. Dorms and the student union are way too noisy."

- Faculty use the library not only to do research, but to find a quiet place to grade papers – away from their office that they might share with another faculty member.

- People still scan the shelves and borrow materials. Just walking through the book stacks and serendipitously finding a title of interest is always rewarding. Students and faculty not only use books and other media in the library, they check out the items and use them.

- The library on campus is a reflection of the institution's commitment to teaching, learning and research. "The library is seen as a reflection of college values and as a symbol of college pride and its appearance and atmosphere play a role in shaping the perceptions of visitors" (Hartman 2000).

- Student and parent expectations are high. Given the rising costs of tuition, room, board and fees, prospective students and their families demand quality faculty, current technology and laboratory equipment, and physical spaces that are inviting, safe and comfortable. They want to see that the college or university continues to invest in its physical plant.

- Frankly, if the library ceased to exist in academe, it would be recreated somewhere, somehow.

Using some or all of these arguments can be persuasive. However, do not expect everyone to support your goals for library renovation, expansion or construction of a new building. Competing physical plant projects exist on almost all campuses. From upgrading a recreation center to renewing the turf on the soccer field; from new lab equipment to pianos for the music department – all are deemed important and necessary for the attraction and retention of students and faculty. What separates the library project from other capital plans is that it is open and available to all, regardless of discipline or department – quite a compelling reason in making the institution the best that it can be.

## Trending

Emphasis on current trends in library design is a large component of this text. The service-oriented model is morphing into a learning spaces model. Implementing this new model of Universal Design requires an understanding of the requirements and aesthetics of academic libraries in today's environment.

Research shows that many factors impact teaching, learning and study. The scholarship of teaching and learning emphasizes learning styles within the context of the social aspects of a discipline. As students use libraries to further their education, careful consideration of interior design strategies is crucial. Color, furnishings, lighting, temperature and humidity control, and security need to be considered holistically when planning changes to the interiors and exteriors of library buildings. Universal Design of libraries invites us to create good design – design that allows users to move throughout the physical facility easily and seamlessly. Universal Design involves placing library services, information

**127**

resources and user study and research space strategically. The "flow" of the building should be intuitive to anyone who enters it.

Technology, textiles and other materials and processes now available in the manufacturing of flooring, furniture, paint, air-conditioning, heating and ventilation provide designers with a plethora of choices. Related industries and government agencies, such as those described throughout this text, persist in creating new and improved standards, products and processes. Similar to the rapid changes in IT, changes in the construction and textile industries occur constantly. As a result, gaining an understanding of interior and exterior library design elements enables us to create spaces that provide the best of learning environments.

Clearly, through site visits, interviews and published research, academic librarians are creating and reinventing spaces. Most academic libraries that have been newly altered include group study rooms with the technology for students to complete room reservations online; inviting spaces for individual study; updated information literacy classrooms that match the teaching and learning styles of today's students; and informal learning spaces in alcoves and other recesses both in and outside of the library itself. Information commons are being reconceptualized to better meet the learning styles of those enrolled at institutions of higher education. The focus has shifted from providing effective and efficient library service to providing students with the academic support that they seek in today's world. This is definitely a trend to watch.

Academic libraries are no longer solely for housing collections and providing library services. Useful collaborations are emerging where partners are invited to "make a home" in the library. Writing centers, and centers for teaching excellence and digital/multimedia production have moved into the library with the goal of providing

students with a complete suite of academic services in a single location. This is not to say that the traditional library functions should be ignored or pushed aside. Rather the opposite. Attention needs to be paid throughout the design process to ensure that collection spaces and study spaces are not overtaken by group study rooms or collaborating partner services. Students still use the library to do research, to study and to contemplate. The library is the only place on campus that provides users with the type of environment conducive to effective learning, the growth of the individual and the potential for the creation of new knowledge. The tendency or desire may be to use every inch of square footage for a room or a service. Wide open spaces, places among the stacks and beautiful views from the windows are expected to be available to students.

## Planning

Embarking on the path of changing a traditional academic library setting to one that is flexible and new is exciting for everyone involved in the project. Developing concept plans for user-centered spaces in academic libraries is challenging. Encouraging design participants to learn about student and faculty needs and wants, to gather ideas from site visits to renovated, expanded, or newly built libraries, to read and digest the literature on Universal Design, and then to take all the information and knowledge and use a blank piece of paper to create new spaces can be frustrating. Initially, the tendency for most librarians is to slightly alter existing configurations of furniture and computers. It may take several meetings to step out of the design "box" to change to a significantly new model. The real work begins once the group becomes comfortable with the process and trusts

those involved in designing new spaces. Crossing that threshold from restricted to free-flow thinking gets the group fully engaged. When this occurs, the floodgates open and ideas flow forward. What you create on paper can be erased, changed and edited. Speaking from experience, it is important to keep pushing the team beyond static thinking into the creative mode. It is there that the true ideas and concepts of Universal Design will emerge.

## Continued relevance

Having the chance to physically change an academic library is often a once-in-a-career opportunity, and what an opportunity it is. As research shows, new ways of thinking about how we learn directly impact and are impacted by, the spaces we create. Where once our goal was to provide library services and resources in an orderly and efficient manner for the benefit of the user, it is now being transformed into understanding the elements of good Universal Design in order to benefit the user. However, in this case, design goals are not solely to create service and resource efficiency and continuity. Universal Design meets the way we learn, study, understand and create new knowledge – both individually and collectively.

This is not to say that the core of our profession is diminished. Librarians' raison d'être is multifaceted, ranging from teaching others to search for, locate and analyze information effectively to the collection development of information in all formats; from knowing where and how to locate quality information to curating collections in print and online; and from collaborating with faculty on research to conducting research in library and information science – both within the discipline and across various areas of interest.

Still, academic libraries are undergoing significant change. The mainstays of the collection (books, non-print, electronic information); information literacy programs; and special collections, in and of themselves, are evolving. The goal of collection development is to continue to support curricula and faculty research, yet within the context of changing formats and new ways to organize, describe, store and access information. Services, such as the lending and borrowing of materials, obtaining resources via interlibrary loan and document delivery, and placing items on reserve to meet copyright regulations are expanding to include the circulation of laptops, iPads and other smart devices, and to monitor the electronic reservation system used to reserve group study rooms. Instruction of information literacy skills is becoming increasingly embedded across curricula by curriculum mapping goals and objectives to content. Additionally, special collections, which comprise a library's most rare and unique materials, are increasingly becoming accessible through digitization and digital curation. We will continue to expand and enhance who we are and what we do.

# Specific take-aways

For those readers who are time deprived and/or overbooked, this section is just for you. It is hoped that you will read through significant portions of this text at some time in the future. However, if this is not possible in the near future, then perusing this section will give you the core basics explained in this book.

## *Interior design does matter*

How you design the interior and exterior, of an academic library makes significant difference for those who use it,

those who work in it, and as a return on investment for the institution. Faculty and students of today search for information, research and study significantly differently from even a decade ago. In today's academic institution there is no place for poorly-lit rooms with rows upon rows of long oak tables with hard-backed wooden chairs. Users expect and demand comfortable furniture in a variety of styles to meet their specific work needs. A student studying for a final exam might prefer to stretch out on a couch next to a side table on which to sit a coffee, while benefitting from good wireless connectivity for their laptop and other electronic devices such as smartphones and tablets. A professor researching various texts might want to sit in an ergonomically correct chair in front of a large table on which to place documents and a computer, along with task lighting for better visibility.

The type of work librarians and library staff do on a daily basis has also changed significantly over the past 10 years. Time spent processing individual books to shelve is decreasing while the digitization of rare materials continues to increase, resulting in a change in workflow. Where once book processing was mostly done sitting, digitizing manuscripts, archives and rare books frequently requires standing to use a large scanner, then sitting to review the image that was scanned. Physical movements are different, resulting in the need for different heights and styles of furniture to reduce such repetitive injuries as carpal tunnel syndrome.

Renovating, expanding, and/or building a new academic library results in a solid return on investment for the institution. Done right, the library can become a destination visited by prospective students and their parents, local community members and visitors to the campus. Applying the principles of Universal Design can result in a quiet, comfortable and safe environment within which to work

and study. It is possible that such an environment will positively impact the understanding and creation of new knowledge. Such a building also reflects the institution's attitude towards education and scholarship.

## *Universal Design works*

Recreating interiors of college and university libraries using the principles of Universal Design is effective. The premise of Universal Design is to develop work and study spaces for people from all walks of life and of all types, including but not limited to age, reading ability, learning style, language and culture. Following some or all of the seven principles of Universal Design will result in spaces that are flexible, that can be used by almost anyone with minimal physical and mental effort, minimizes the possibility of accidents, and provides the right size and space so that the building can be easily navigated.

## *Today's users are not yesterday's users*

Students of today are living in a chaotic world where the majority of information is not stored on personal computers, but is located in "the cloud," mostly off campus. The population is increasingly diverse in terms of age, race, sex, ethnicity and sexual orientation. Where once students primarily studied and worked alone, today's educational and workplace environments are ones requiring collaboration, team building and cross-functional communication. The traditionally aged students of today have not lived without the internet, cell phones or computers. Cable and on-demand services have always existed, and food has always been allowed in libraries. However, even living in this new world,

students still crave places to study quietly and to contemplate in spaces meant for such activities. They want libraries with book stacks, but also with amenities such as those found in a café, robust wireless connectivity and electrical access, comfortable furniture, good lighting, and 24/7 access.

Faculty have changed the way they use academic libraries as well. Where once professors spent hours searching card catalogs, browsing the stacks and reading tomes, teachers now do a majority of their information seeking outside of the library – in their offices, at home, or at the local coffee shop. As with students, though, they still desire to have a library where they too can read, reflect, meet students and colleagues and grade papers.

## *Do your own research*

Creating effective academic libraries requires you and your team to do your own research in order to learn about best practices – what worked, what did not work, and what pitfalls need to be avoided. It is worth providing multiple opportunities for faculty, students and staff to give input and feedback to the planning of the construction project; this can be achieved through surveys, focus groups, models and the like. Searching online for current ideas in academic library design is critical to gaining an understanding of new design strategies and new developments in textiles, furniture, HVAC equipment and so on. Site visits to institutions where libraries have undergone recent renovation, expansion, or new build is critical. Talking with colleagues who have just experienced construction will provide invaluable information on which design approaches to take, which ones to discard, and ways of improving the process and outcome.

## *Standards, rules, and regulations*

In a construction project, no one expects the library project team to deeply understand federal, state and local building codes or various industry association specifications. However, knowing a bit about what is and what is not permissible in renovation/new build will alleviate delays in the project. Building, construction and design codes are complex and forever changing. Knowing about regulations regarding accessibility issues, occupational health and safety rules, and sustainability guidelines is important to the quality of your project.

## *Selection matters*

The items you select to be included in your renovation/ construction project will impact users' experiences over the long term. Color selection, flooring types, furniture options, task lighting, security systems and interior comfort levels will all have an immediate impact on those who use the library. Renovation, expansion and new build represent an expensive undertaking for libraries, and the intervals between such projects tend to exceed five years. It is therefore important that the elements selected for installation in the library building will (a) last a long time and (b) look as new five years from now as they do on the day they were installed.

## *Options, options, and more options*

Users of libraries often look to experience the building in different ways, depending upon their reasons for visiting. As such, design teams need to be aware of these reasons, which can include wanting to study alone (individual study

rooms/carrels), to study in groups (group study rooms), to be able to enjoy a beverage while socializing (café), to search for information and/or obtain research assistance (iCommons), etc. Group study rooms need to be equipped with technology, flexible furniture as well as wall-writing surfaces. Glassed-in or partially-glassed walls with effective sound-proofing enable students to be seen, but not heard through the glass.

## Classrooms have changed

The design of classrooms used within libraries – primarily to teach information literacy and discovery skills – has changed significantly. Staging tables and computers around the room with the instructor at the front of the room with a computer, video display projector and screen does not provide the flexibility to work with various teaching pedagogies. Today, classrooms are comprised of round tables and chairs on wheels so that furniture can be quickly reconfigured as needed. Technology, such as laptops, tables, PCs, etc. is available for use, but does not take center stage. Instead, technology is hidden away until it is to be used in instruction.

## iCommons is also changing

The iCommons concept that emerged in the 1990s is morphing into something new. Where the original iCommons concept focused on providing effective information resources and library services, today's iCommons more fully provides academic support for students in a learning environment. The traditional multi-service information desk and self-service business-type services, such as printing and scanning, are being enhanced with research reference suites where

librarians can consult one-on-one with students or with groups of students. GIS, statistical analysis support and grant assistance are being added, as well as basic multimedia production and writing center services. A one-size-fits-all model of an iCommons has changed into a model that contains the various elements necessary to meet the specific needs of students and faculty at an institution.

## *The library has tenants*

Libraries once only housed dedicated information resources and library services. In the building, users had access to print collections, interlibrary loan and circulation services, places to study, as well as computers to do research and print papers. With the increased cost of real estate, institutions are looking for ways to combine services in less square footage while improving services to students and faculty. In doing so, libraries are now homes to writing centers, centers for digital humanities, media production services, as well as centers for teaching excellence. The goal is to make sure that the service is compatible with the goals and purpose of the library itself.

## *Learn from others and learn from yourself*

Finally, take the time to connect with those who have experienced a similar process and project to the one you are embarking on. Understand their successes as well as their failures. In addition, give yourself and your team leeway to "play" – engage in creating various scenarios and plans. It is only through knowing best practices and via trial-and-error that you will be successful in developing an academic library environment that is designed for all who enter it.

## Conclusion

Understanding that changes to our profession and changes in the characteristics and attributes of students and faculty will be continuous is critical to our success in remaining an integral part of academe. Knowing how these changes impact the physical library building and how best to meet these changes is the challenge that lies before us. It presents us with the opportunity to revitalize space so that its interior and exterior directly provide a positive experience that enhances teaching, learning and research on campus. What we design and create needs to resonate with our users so that they return again and again. Following the tenets of Universal Design will enable us to make the student or faculty member's academic experience valuable and enriching.

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# Index