

The logo for LITA (Library Information Technology Association) is a black square with the lowercase letters 'lita' in white.

A LITA Guide

CREATING INCLUSIVE LIBRARIES BY APPLYING UNIVERSAL DESIGN

A GUIDE

Carli Spina

Creating Inclusive Libraries by Applying Universal Design

LIBRARY INFORMATION TECHNOLOGY ASSOCIATION (LITA) GUIDES

The Library Information Technology Association became part of Core: Leadership, Infrastructure, Futures, also a division of the American Library Association, in September 2020. Guides published in this series retain the series title LITA Guides.

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The Library Information Technology Association (LITA) Guides provide information and guidance on topics related to cutting-edge technology for library and IT specialists.

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Creating Inclusive Libraries by Applying Universal Design: A Guide

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Carli Spina

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The goal of this book is to bring together years of reading, studying, and discussing Universal Design and the related framework of Universal Design for Learning as they are applied in a wide range of settings. I have been fortunate to be able to learn in formal settings from leaders in the field, such as Dr. David Rose, one of the originators of Universal Design for Learning, and to work closely with librarians who are deeply committed to inclusion and Universal Design in libraries.

This book is a product of all of this work, and I am grateful for everyone I have learned from and worked with throughout this process. While I could not begin to thank everyone on this list, I would like to take this opportunity to thank everyone who was willing to talk to me about their work applying Universal Design and Universal Design for Learning in libraries. Interviewing practitioners at a wide range of institutions as part of the process of writing this book, and particularly crafting the case studies, has given me even more certainty that Universal Design offers opportunities to improve inclusion in libraries and has left me even more impressed by the work done by my colleagues throughout the field of librarianship.

Preface

PURPOSE

Universal Design is a concept that has a versatility that makes it valuable far beyond the original architectural applications for which it was originally created. As a design philosophy, it is a way of thinking about inclusion throughout the design process that has the ability to be transformative if adopted in a thoughtful manner. In particular, as libraries have sought new tools and approaches to become more inclusive, the principles of Universal Design and Universal Design for Learning have begun to be adopted by some institutions as a way of better designing for all members of their communities. This approach offers a new way of thinking about who a library's users are and what their needs may be in any situation. It also offers a structure for thinking about design in a way that brings diversity to the forefront.

Creating Inclusive Libraries by Applying Universal Design: A Guide offers an introduction to Universal Design and the related framework of Universal Design for Learning. It seeks to give readers the tools to reconsider all aspects of design in their libraries through the lens of these approaches. While this book offers checklists to help start readers down these paths, it is important to remember that these topics are hard to fully sum up in a one-size-fits-all list. These tools can provide guidance and serve as a reminder of the key principles and steps in the process. However, it is important to remember that Universal Design is most successful when it is thought of much more holistically throughout all library work.

AUDIENCE

Because of the breadth of the principles of Universal Design, they are applicable in virtually any instance where design work is being done. These principles can be applied at all types of libraries that serve diverse communities, from school libraries to special libraries. This book covers examples of Universal Design being successfully applied in public libraries, academic libraries, and school libraries, and these are just a few of the places where it can have a meaningful impact. This book is designed to be useful for any reader who works in libraries and has an interest in design of any sort. It does not assume that a large budget or any specialized skills are available and aims to make the application of these principles approachable in a wide array of specific situations in libraries.

ORGANIZATION

This book is split into two sections. The first section focuses on Universal Design as a concept, diving into the principles and examples that are important in this approach to design. It offers not only a view of Universal Design, but also considers reasons it has been criticized and how it can best be applied in a library setting. The second section considers a specific framework based on Universal Design as applied to education. Called Universal Design for Learning, this framework can be used to make all levels of education more accessible and inclusive. It is applicable not just in formal classrooms, but also in the design of learning tools, informal learning materials, educational programming, adult education, professional development, and similar educational content that is offered at many libraries. This section of the book considers critiques of this approach and how it can be used to the greatest effect. It also discusses specific ways that libraries can use this approach to achieve their educational mission for patrons of all ages.

A NOTE ABOUT LANGUAGE

Throughout this book, readers will encounter a mix of identity-first language (e.g., a “disabled patron”) and person-first language (e.g., a “patron with disabilities”). The choice of language is an important and, sometimes, controversial one. Members of the disability community can and do disagree on the preferred approach to language, and it is, ultimately, a very personal decision for some individuals. Moreover, the preferences can vary between disabili-

ties, and preferences and norms around language have changed over time and may well continue to change as time proceeds. There is no single agreed-upon approach to this language, but one core principle is to respect the preferences of individuals in how they would like to personally refer to their disability.

Chapter One

Introduction

The Role of Universal Design in Libraries

On September 24, 2019, Queens Public Library opened the first new branch in over a decade to great fanfare: the Hunters Point Community Library.¹ The project cost \$41.5 million² and took almost a decade from the start of the design process to the opening of the building.³ The design selected for the building is a dramatic and modern one that is already a distinctive part of the view of Queens from Manhattan. Initial reports seemed to consider it a triumph. An architectural review in the *New York Times* by Michael Kimmelman said, “The library is among the finest and most uplifting public buildings New York has produced so far this century.”⁴ Another review in *New York Magazine* was titled “The Hunters Point Library Was Too Expensive, and Is Worth It” and argued that the building had “already become an equivocal lesson in what, and how well, the city can build.”⁵ At the time of its opening, the Queens Public Library President and CEO said, in part, that “As remarkable as this building is, there is far more to a library than its design and physical structure that makes it soar. It is the experience of coming to a place that welcomes you, no matter who you are or where you are from, and interacting with other people who are striving for something more, and staff who want only to help. That is the promise we are committed to fulfilling not only at Hunters Point Library, but also at every location across our system.”⁶

However, a mere ten days after the opening, the library was back in the news. A local publication, *Gothamist*, published an article highlighting the fact that the library has some serious accessibility issues.⁷ It was not achieving its stated goal of welcoming all. A single elevator served the entire 22,000-square-foot building. And the very features that were praised in the *New York Times* review (the “sequence of tiered desks, book stacks and social spaces”⁸) meant that a segment of the fiction section of the library was inaccessible to those who cannot use stairs. Online, the backlash was immediate,

with many other publications covering the situation, and social media users weighing in on their disappointment that a brand-new building was inaccessible in key respects.⁹

The library's spokesperson initially released this statement: "The building complies with all building codes, including the ADA. . . . Our staff has been and will continue to retrieve books for customers, and we are going to offer devices that will allow customers to browse the materials available in those areas."¹⁰ But within a few days, a new statement was released, saying, "We will move the books to another location in the library and provide regular updates to the community."¹¹ This disconnect in how the design team thought about access was even more clear in remarks by a senior partner at the design company responsible for the building, who stated in an interview with the *New York Times* that the accessibility failure was a "small wrinkle in an incredibly successful project," going on to say "To be honest, we hadn't thought, 'O.K. we have to provide an exactly equivalent browsing experience.' . . . This will be a new standard for libraries, and that's great. But that doesn't mean it's a flaw in the design. It's an evolution."¹²

More troublingly, however, there is a question as to whether even the minimum legal requirements were met. A class action lawsuit was filed in federal court on November 26, 2019, stating that the library "was designed and built with a total disregard for adults and children with mobility disabilities and in flagrant contempt of the legal requirements of the Americans with Disabilities Act."¹³ It may well take time for this suit to work its way through the legal system, but regardless of its outcome and even if the court determines that the building complies with legal requirements, it is clear that this was not enough to meet the community's actual needs.

Moreover, these design decisions impacted a far wider segment of the community than individuals who cannot use stairs. In particular, anyone with a stroller or a young child is likely to find the children's department far from welcoming as the single elevator and limited stroller parking space make it difficult to get to children's programs. This problem is compounded by the fact that the stairs to the children's space are currently closed because "library officials, in a walk-through before the building opened . . . saw a potential liability for small children who could jump and fall on them."¹⁴ The controversy surrounding these aspects of the library's design show that the architects overlooked the needs of some important subsets of the local population. Their design was aesthetically pleasing but was not able to meet the day-to-day needs of many different types of patrons. This makes it an exclusionary space rather than a welcoming and inclusive community hub.

Less than a month after news of the Hunters Point Community Library's issues came to light online, an article was published about the Mui Ho Fine

Arts Library at Cornell University.¹⁵ This new design, which was described by the project architect as “an immediate and quite physical invitation to discover an extraordinary collection,”¹⁶ was created to make a statement. Central to the design are new floors made up of “specially-manufactured steel grates . . . with gaps big enough to allow air to circulate.”¹⁷ Combined with this unique floor are railings and cage-like elements at the end of each row of stacks. Taken together, the effect is one of openness, and the sight lines in the space are maximized in a way that adds to the drama of the space and displays the library’s holdings in an eye-catching manner.

The striking design impressed many. The University Librarian at Cornell University described the space by saying, “The books and their shelving form a sculptural whole, a breathtaking tribute to the potential of the printed word and image to inspire learning, research, creativity and innovation.”¹⁸ However, this dramatic presentation did not take into account the needs of all the library’s patrons. One of the first issues to come to light is that the gaps in the floor grates mean that patrons wearing dresses, skirts, kilts, or similar attire have to worry that those below can easily, and even unintentionally, look up and see them. This has already made some patrons reconsider how they use the library.¹⁹ Beyond this, the grated floors can present issues for anyone wearing high heels, walking with an assistive device such as a cane or crutches, or those who use wheelchairs, though it is worth noting that the project was reviewed for accessibility issues.²⁰ This floor could also impact some types of uses of the stacks, such as making it difficult to use some types of carts and book trucks. In the winter, these grated floors could potentially also present an entirely different type of issue in a region that has a significant amount of snow and inclement weather. As Audrey Wachs noted in an article on the space, “Slushy boots will have to be thoroughly de-cruded before entering to avoid spreading debris on other patrons (or worse, the expensive monographs).”²¹ The design as a whole can also present real problems for those who may be uncomfortable with heights, since patrons can see all the way down from whatever floor they are on, both through the floor and from the railings at the end of each row. In fact, given the railing at the end of the rows, this could greatly diminish these patrons’ ability to access books in the space even if the floors could be somehow covered.

Overall, the building’s elaborate design may look impressive, but at the same time it makes the space difficult and uncomfortable for many different users. As Sarah Rose Sharp noted in an opinion piece about the library’s design, “One might almost think that the five-year design process of the library involved male architects thinking harder about how to make the space accommodating to books and air rather than females and disabled bodies.”²² Several months after initial reports of the controversy, the Dean of the Col-

lege of Architecture, Art, and Planning was interviewed by the university's paper, *The Cornell Daily Sun*, about the design. She said, "Each point raised is an opportunity to think through the design and function of the library and its overall mission. . . . The building is fully ADA compliant, and time and use will allow us to explore options that ensure that the space is inclusive, welcoming, and inspiring to all,"²³ suggesting that over time the school may plan to try to address at least some of these concerns. Ultimately, the design has generated controversy that has arisen just as the school is hoping to celebrate this new space and the commitment it demonstrates to the library's collections and services.

In addition to being an embarrassment for these high-profile public projects, these problems are emblematic of issues that are still seen at many libraries. Those issues relate to the difference between technical accessibility and true inclusion. Despite being two vastly different libraries, serving very different populations, both of these libraries faced similar criticisms—namely, that they failed to consider the needs of significant portions of their patron populations in making expensive and difficult-to-change design decisions. Through these decisions, they have sent the message that their spaces are only intended for some smaller subset of their community. No matter how unintentional this message may be, it is hard for patrons not to sense the exclusion when they find that certain spaces exclude those using specific tools or wearing certain types of clothing.

In these cases, the critical decisions centered on architecture and structure, but decisions relating to accessibility and inclusivity occur in all aspects of library design, from interior design to instructional design and everything in between. Many times, these decisions aren't even conscious ones. Seemingly small choices, based on assumptions that are never questioned and never considered through different points of view, can have a huge impact on how inclusive, accessible, and welcoming a library is and how it is perceived by its community. While accessibility issues are often the ones that are thought of first, even projects that are focused on making sure that they meet all legal building and accessibility standards can fall far short of being inclusive once fully implemented. Universal Design is an approach to design that can help to take projects from technical legal compliance to true inclusion. The principles, techniques, and examples discussed in this book offer a road map to creating an experience that is inclusive of those with a whole range of needs and preferences rather than detailing specific requirements of the laws of any particular jurisdiction. While it is, of course, important to comply with laws related to accessibility, Universal Design makes it possible to go beyond this to find solutions that will make your library's spaces and services inviting for a wide array of different patrons with differing needs, interests, and preferences.

This book offers an introduction to both Universal Design and Universal Design for Learning from a library perspective. The principles of Universal Design and Universal Design for Learning guide a process that ensures that multiple perspectives are considered, many groups are served, and the final design offers features that work for the broadest possible array of people. They ensure that the needs of many types of users are considered and addressed. Moreover, by making this process more systematic, these principles can be utilized to address these needs early in the process to avoid unnecessary and costly design changes. The following chapters will introduce the principles of Universal Design and Universal Design for Learning and offer examples from real libraries showing the impact of applying these principles to library design projects. From case studies to checklists, this book offers concrete information that can be applied to all types of libraries and many different service areas within libraries. Applying the principles of Universal Design and Universal Design for Learning across all types of library projects will make for a more accessible, inclusive, and welcoming library that will serve the needs of many different community members.

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Chapter Two

Defining Universal Design

Key History and Context

Though we may not realize it, design impacts almost every aspect of our life. Design can have a strong positive influence: usable or even enjoyable designs can improve happiness, satisfaction, productivity, effectiveness, and more. However, design, particularly thoughtless design, can have a profound negative impact as well. Worse yet, designs that have a negative impact on only some groups of people can result in a significant discriminatory effect that is practically invisible to the majority, who is not negatively influenced by the design. Stairs in the main entrance to important civic spaces, monolingual signs without supporting symbols, and websites that are inaccessible to screen readers are just a few ways that design can prove to be a barrier to some, while being blithely ignored by others. That these designs create significant barriers for some is not only invisible to the majority of users but can also be invisible to those responsible for creating and implementing the designs as well. As Aimi Hamraie notes regarding architectural design, “The design of the built environment actively conditions and shapes the assumptions that the designers, architects, and planners of these value-laden contexts hold with respect to who will (and should) inhabit the world. In short, built environments serve as litmus tests of broader social exclusions.”¹ Ultimately, this is equally true of other types of design as well. Without care, the same social exclusions and marginalizations seen in society will be reproduced and enforced by design decisions.

Unfortunately, because of the ease with which these issues can be overlooked, designs that exclude at least some users are extremely common. This is true for two interconnected reasons. First, many designers may not even be aware that their designs inadvertently create barriers for some users, and, as a result, they do not take the needs of these marginalized communities into account during the initial design process. Second, and closely related to the last

point, one of the reasons that designers fail to see the needs of some groups more regularly than others is that they do not involve members of all potential user groups in the design process, resulting in decreased visibility. As an example, disabled individuals are still less likely to be hired as designers and are also less likely to be consulted during the design process or included in user testing activities. However, it is important to note that this example is equally true when referring to any marginalized group in society, or any individual who is a member of multiple marginalized groups simultaneously.

While Universal Design cannot single-handedly solve this problem, following the principles can improve design outcomes, particularly when combined with making a conscious effort to involve individuals who represent many different sets of needs, types of use cases, interests, and communities in the design process. It offers an approach to design that focuses attention on inclusion and designing for the needs of the largest possible number of users, no matter their specific needs. As such, it offers a response to the design approaches that preceded it, which focused on reaching users, but conceived of that group in a less inclusive manner. Given the importance of inclusion in this approach, it makes sense that it is called “Universal Design,” which offers a hint to the way that it leads to design choices that offer a satisfying user experience for users who have been underserved in the past.

WHAT IS UNIVERSAL DESIGN?

Universal Design emerged as an attempt to address many of the common design issues and barriers to use that existed prior to its creation. It is an approach to design defined by its focus on the user and how it contemplates who the user is. While many modern approaches to design are user-focused, in this case, the focus is specifically on users whose needs may differ from those of the assumed average user. This means that the core of the approach is an attempt to foster equitable use by those of all ages, sizes, backgrounds, and abilities, a goal that is routinely not adequately addressed by other approaches to the design process. Rather than creating multiple designs that will only meet the needs of specific subsections of the potential user group, under Universal Design multitudes of different users are served by a single design without the need for separate accommodation or adaptation.

The definition of Universal Design is “designing all products, buildings and interiors to be usable by all people to the greatest extent possible.”² From this formulation, it is clear how important breadth is to the concept. Not only does this definition broadly apply to architectural, industrial, and interior design work, but it also sets the goal of successful design as “usable by all

people.” This version of the definition was coauthored by Ronald L. Mace, the architect and designer who coined the term. But even when referring to other versions of the definition, the same key elements remain—namely, a focus on covering multiple fields of design and striving toward total inclusion with the final creation when it is put into use.

However, an often-overlooked element of this definition is its aspirational nature, which is just as important as its breadth. The concept at the conclusion of the definition, “to the greatest extent possible,” was one that Mace came back to more than once, and, in fact, in his last speech on the topic in 1998, said, “I have never seen a building or facility I would say is universally usable. I don’t know that it’s possible to create one. I’m not sure it’s possible to create anything that’s universally usable. It’s not that there’s a weakness in the term. We use that term because it’s the most descriptive of what the goal is, something people can live with and afford.”³ This is absolutely key to the definition. The reason that this qualification is important is that it acknowledges that it may not be possible in all situations to create designs that will truly work equally well for 100 percent of all current and future users. Though the goal is to create universally usable designs, it is important to acknowledge that there always remains the need to offer further accommodations for some users, even after implementing Universal Design; this realization ensures that this approach is a practical one and not an unattainable dream. By focusing on maximizing the inclusion offered by a particular design, creators can optimize their design without finding themselves unable to launch any viable solution at all or being limited by criticisms. It helps to clarify that implementing Universal Design may not, by itself, be enough to achieve complete inclusion in all cases. This sets the clear expectation that the concept will have to be flexible and must be used in conjunction with other inclusive and equitable practices throughout the product’s lifetime.

THE HISTORICAL CONTEXT OF UNIVERSAL DESIGN

To understand the emergence of Universal Design, it is important to understand how it developed and how it was influenced by the history that preceded it. Throughout history, people have struggled with design decisions that created or reinforced barriers for some users. However, during the course of the twentieth century, several factors came together to create an environment where these barriers began to be addressed. From an accessibility standpoint, there were two important changes in the United States throughout the century: an increase in both the number of individuals with disabilities living in the community and a number of antidiscrimination laws that attempted to

combat prevalent discriminatory practices against both those with disabilities and other marginalized groups. These factors helped to pave the way for a world where the types of users making use of various spaces and services came to include broader and more diverse segments of the population and also a world where the needs of a greater number of individuals were considered during the design and marketing processes.

The increase in the number of disabled individuals living in the community was due to several factors. One aspect of this increase is that the United States experienced widespread polio epidemics throughout the first half of the twentieth century. As Lauro S. Halstead notes, “During the 1930s, 1940s, and 1950s, the polio epidemics seemed unstoppable. . . . From 1951 to 1955, approximately 40,000 cases were reported each year, with infections striking increasingly at older children and young adults.”⁴ While many of these individuals died, many others survived with ongoing physical disabilities. This rapidly increased the number of individuals with physical disabilities who wanted to use public spaces, services, and other accommodations. It is worth mentioning as a part of this context that Mace himself contracted polio as a child and therefore used a wheelchair throughout his life.⁵ His own disability and the barriers that he encountered due to it, which included inaccessible facilities at North Carolina State University where he studied architecture,⁶ informed his work and helped to contribute to his role in the development of Universal Design.

Other factors also influenced the size of this population in the United States. In 1967, the process of deinstitutionalization began, which aimed to significantly decrease the number of people with mental, developmental, and other disabilities living in institutions.⁷ At the same time, the life expectancy and quality of life of individuals with many types of disabilities continued to increase with medical advancements. Taken together, these factors meant that a greater percentage of people with disabilities were living as part of communities for longer periods of time and, as such, sought to make use of the same services and spaces as others in those communities.

The twentieth century in the United States also saw a rapid growth in civil rights activism and demand for laws to address long-standing discriminatory practices. Taken together, these laws significantly changed the level of inclusion that was expected in all aspects of life. In the United States, the Civil Rights Act of 1964⁸ and the court cases that followed it started the country on a path toward desegregation and toward the expectation that user groups would reflect greater diversity. The Rehabilitation Act of 1973 followed less than a decade later and included provisions that started to prohibit discrimination on the basis of disability.⁹ During this same period, disability activism took off. Through protests, advocacy, negotiation, and more, disabled people



Figure 2.1. Ronald Mace working at a desk.
Photo courtesy of NC State University, Center for Universal Design.

and their allies throughout the country made great strides in improving access and decreasing disability discrimination. They also pushed for greater legislative protections. In March of 1990, this activism culminated in the “Capitol Crawl,” a protest at which disabled people who used assistive devices such as crutches and wheelchairs put them aside to instead crawl up the stairs of the US Capitol Building to draw public attention to the barriers that they faced every day of their lives. This protest saw “irritated lawmakers step over and around” the protestors and is “widely credited as the final push that resolved congressional deadlock”¹⁰ surrounding the Americans with Disabilities Act (ADA), which was ultimately passed in 1990.¹¹ This law was a major achievement and promised huge changes to the lives of disabled people in the United States. It made many types of disability discrimination illegal, in particular requiring that “public accommodations” be accessible to those with disabilities. This meant new legal standards of minimal accessibility and new avenues for enforcing these standards.

In the design sphere, strides were being made for individuals with disabilities even before the passage of the Americans with Disabilities Act. One of the most important of these movements was the barrier-free design movement. Selwyn Goldsmith, who was another designer with polio and who wrote the 1963 volume *Designing for the Disabled*, was extremely important in this arena. His work was pioneering in the field of accessibility for disabled people, and some of the ideas he popularized would go on to be seen as excellent examples of Universal Design, such as curb cuts that allow individuals who use wheelchairs to navigate city sidewalks.¹² His work, in combination with the developing legal framework for accessibility in the United States, was instrumental to the development of Universal Design as a new approach to the design of architecture, products, and more.

HOW DOES UNIVERSAL DESIGN DIFFER FROM ACCESSIBILITY?

Though the two concepts are often conflated, Universal Design is not the same as accessibility. The term “accessibility” has many different definitions. However, in the context of designing for usability, it is typically used to refer to the amount of access that disabled individuals have to a space or item. For example, the Oxford English Dictionary defines “accessible” in part as “capable of being conveniently used or accessed by people with disabilities; of or designating goods, services, or facilities designed to meet the needs of the disabled.”¹³ This definition makes it clear that the focus of accessibility is solely on disabled users and not the broader spectrum of users who may have

specialized needs. Moreover, in many legal jurisdictions with antidiscrimination laws that protect disabled individuals, *accessibility* is most frequently used as a shorthand to refer to legal compliance with these laws. Thus, it is used to mean that the minimal standards applicable to a situation have been met and not that all users have optimal access to the space, service, or activity in question.

Universal Design has a broader focus that looks to move beyond mere compliance with legal minimums. As Mace put it in his last speech on the topic, “Universal design broadly defines the user. . . . Its focus is not specifically on people with disabilities, but all people.”¹⁴ This makes it a fundamentally different concept from accessibility and one that challenges those who employ it to move past the legal standards that they have focused on in the past toward genuine usability, equity, and inclusion for all users no matter their circumstances.

At its core, Universal Design aims to go beyond access for users with disabilities toward a more complete consideration of the ways that design currently disadvantages all marginalized users and the changes that are needed to avoid this in new tools, products, and services. This broad focus is why Universal Design offers so much potential. When applied thoughtfully, it can lead to designs that improve the outcomes for all users, particularly those users who have been overlooked or explicitly excluded by past design choices, whether on the basis of ability, gender, age, race, sexuality, or any other characteristic.

COMPARING UNIVERSAL DESIGN, DESIGN FOR ALL, BARRIER-FREE DESIGN, AND INCLUSIVE DESIGN

Universal Design is sometimes treated as being synonymous with other similar terms that are more common outside the United States, though these other terms are often used in slightly different manners. In the United Kingdom and parts of Europe, a very similar concept is frequently called “Design for All.” The European Institute for Design and Disability (EIDD) Stockholm Declaration 2004 defines it as “design for human diversity, social inclusion and equality.”¹⁵ This makes the goals of inclusion and equality more explicit, but does not specifically include the acknowledgment that entirely universal designs are likely impossible. While this is certainly not to say that the reality in a Design for All environment remains the same, the lack of a specific qualification on this topic is one noteworthy difference from the traditional conception of Universal Design.

In Japan, as well as some other non-English-speaking countries, the term *barrier-free* has come to be used to describe designs that would meet the same criteria. It shares the same commitment to design that is universally usable for all regardless of their ability level. However, barrier-free design tends to have a more narrow focus on designs that remove the barriers for people with certain types of disabilities that traditional design projects tend to include, such as stairs, inaccessible doors, and other physical barriers. In the United States, the term *barrier-free* was more common prior to the advent of Universal Design, as discussed further below. It is still sometimes used to refer to the process of removing these sorts of physical features from architecture, but it is generally not used to refer to the broader concept of incorporating universal usability into all types of design projects.

Another similar concept is “inclusive design,” which is sometimes used interchangeably with Universal Design, although it is actually different in ways that are important to understand. The Microsoft design toolkit on inclusive design defines it as “a design methodology that enables and draws on the full range of human diversity. Most importantly, this means including and learning from people with a range of perspectives. Designing inclusively doesn’t mean you’re making one thing for all people. You’re designing a diversity of ways for everyone to participate in an experience with a sense of belonging.”¹⁶ Rather than attempt to create solutions that address the needs of all, it suggests that designers should offer greater ability for each user to choose their own solution. As Kat Holmes says in *Mismatch: How Inclusion Shapes Design*, inclusive design “emphasizes one-size-fits-one solutions” while Universal Design “emphasizes one-size-fits-all.”¹⁷ It is also a concept that grew more out of the digital world than physical design.¹⁸ These differences are significant, particularly when it comes to the degree of inclusion in the solutions they develop. While personalization options in online spaces make equitable experiences designed with a “one-size-fits-one” approach more of a possibility, in physical spaces, this may tend to prioritize separate solutions more akin to traditional accommodations that physically separate users based on their needs. In these instances, Universal Design’s focus on a single solution that works for a wide group of users can foster greater inclusion.

Though these concepts all occupy separate spaces in the design field, they are admittedly closely related. As Hans Persson, Henrik Åhman, Alexander Arvei Yngling, and Jan Gulliksen note,

The different approaches of designing for accessibility are merging and becoming increasingly difficult to distinguish from each other. For example, in a note to the recommendation from the EU Ministers’ meeting of 2009, the terms “design for all,” “integral accessibility,” “accessible design,” “inclusive design,” “barrier-free design,” “transgenerational design” and “accessibility for all” are

regarded as converging towards the term “universal design” as it is used and defined in this context.¹⁹

Regardless of whether a complete convergence of these terms is imminent, Universal Design is not only common in the United States, but also has some clear advantages. Its focus on addressing diverse needs that go beyond those of disabled users makes it a useful tool for making inclusion of all groups a priority, something that is vitally important in libraries. Its qualifications that clarify that it may not lead to design that truly meets the needs of every potential user are also important, particularly in jurisdictions with laws that provide for disability accommodations. They ensure that it is clear that additional accommodations may still be required even after the application of Universal Design.

WHOM DOES UNIVERSAL DESIGN SERVE?

Ideally, Universal Design offers a way to design products, services, and more that can appeal to and meet the needs of users of all sorts. While most primarily associate it with design that benefits disabled people, applied effectively, Universal Design can address the needs of many other individuals with many other types of needs. When considering a design through the principles of Universal Design, it is key to consider the needs, desires, and potential issues encountered by a wide range of types of people and not just those who are eligible for accommodations under accessibility laws and standards. This breadth of potential impact is one of the advantages of taking this approach to design questions as they arise.

Some examples of the groups who are most commonly offered better experiences through Universal Design are as follows:

- Disabled individuals, such as those who use wheelchairs and are well served by accessible main entrances at both businesses and homes
- Individuals with short-term injuries, who may not consider themselves disabled but do benefit from the same features such as universally designed restrooms
- People who do not speak the language that is predominant in their current location, such as a traveler taking advantage of the symbols on the signs in airports
- Children, such as those who can make independent use of checkout counters that are built lower to accommodate more users
- Elderly individuals, such as those with declining vision, who may be better served by large and high-contrast print both online and in print

- Distracted people, such as those who are using an item while also using their mobile device or talking on the phone
- People who want to make new and nontraditional uses of items, such as drivers who want to use their mobile devices entirely hands-free
- Individuals who are larger or smaller than most users, such as those whose height means that they are better served by flexible seating
- All users who appreciate efficient, effective, enjoyable, and engaging designs in the world around them

Though these are the major groups who will see benefits from Universal Design, it can truly improve the experience of all who come in contact with the design when done effectively. For example, while most institutions focus on the advantages available to their customers and patrons, Universal Design can also have significant advantages for the employees who interact with the design decisions at their workplace more than anyone else. As a means of improving the outcomes for everyone who comes into contact with the final design, this approach can have extremely wide-reaching impacts.

The key to achieving this wide-ranging impact is to be open and methodical when applying the seven principles of Universal Design. When applied without this caution, the needs of some groups can remain unmet, which leaves the same barriers still in place even after a process that theoretically



Figure 2.2. Man using an automatic door. Automatic doors are one common example of Universal Design in action.

Photo by Amanda Mills.

took a Universal Design approach. This is because it can be difficult to recognize all of the groups who have been overlooked in the past. This book includes examples of how this can be achieved through careful application of the principles and by involving members of these various groups early in the design process. By itself, Universal Design is not a means of improving outcomes for all of these groups. It is vital that it is carefully applied to achieve its benefits and ensure that it truly improves the inclusivity of the final design. However, with proper care, it has the ability to ensure that design decisions offer an experience that is welcoming for the widest possible group of individuals.

APPLYING UNIVERSAL DESIGN TO LIBRARIES

Universal Design has advantages to offer in a variety of settings from industrial design to curriculum creation. This has led to a significant increase in its popularity and application across industries since its development in the 1990s. In this book, Universal Design is considered specifically as a method of improving the ability of libraries to be equitable and inclusive for patrons with a wide range of different needs and preferences. Applying Universal Design's principles makes libraries significantly more accessible for individuals with disabilities and offers these users an option to make use of the library and its services in ways that are more integrated with and equitable to the experiences of other patrons. This is enough of a reason for many libraries to embrace this approach as a way to go beyond the minimum accessibility requirements that apply in their jurisdiction.

However, it can also go far beyond this. Thoughtful application of these principles can make a library more inclusive for many user groups who are often underserved in communities, including patrons who do not speak English as their primary language, elderly patrons and other marginalized groups, as well as busy and distracted patrons. At libraries that know that particular segments of their community are currently poorly served by the existing spaces and services, it is important to consider how the principles of Universal Design would guide a redesign effort that includes and responds to the needs of individuals in these underserved groups. This consideration can offer clear and approachable avenues for ongoing improvement. It is when these principles are overlooked that barriers emerge and patrons are excluded from active engagement with the library and its various collections, services, programs, and other offerings.

Universal Design can be applied to the full spectrum of design decisions. Whether designing a physical item, creating a website, selecting new furniture

or fixtures for a space, or even developing a new library program, Universal Design will offer guidance on how to remove barriers to users at the design stage. Applying these principles helps to ensure that these barriers are not invisible to the design team and therefore ignored until it is too late to make a design inclusive. Though it is not a replacement for accessibility efforts and compliance with applicable laws, rules, and regulations, Universal Design is a path toward newfound inclusion for libraries of all sorts and with all sizes of budgets. Making it a part of a library's normal design and decision-making processes can improve outcomes and create a genuinely inclusive, welcoming, and enjoyable environment for all library patrons.

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Chapter Three

The Principles of Universal Design

While the concept of inclusion is one that many people support, it can be difficult to determine how to achieve this goal. Many projects that are developed by those with the best of intentions do not achieve their goals of true inclusivity for a whole host of reasons, many of which are related to misunderstanding what is required to make a space or service usable for all. Sometimes this results from mistakenly overlooking the needs of an entire group of users. Other times it is the outcome of an overreliance on meeting minimum legal requirements to the exclusion of implementing more innovative and broadly usable solutions to design problems. Moreover, even designers and project leaders who are specifically focused on inclusivity struggle with how to put this into practice in their own design projects.

Universal Design, as a comprehensive framework to guide design efforts, can be extremely helpful in ensuring that the correct issues are considered and the final outcome is widely usable. Even once the concept of Universal Design is defined, however, it still can leave many open questions about what actual steps need to be taken to achieve true inclusivity in practice. In fact, when the definition of Universal Design was originally developed, implementing Universal Design into practice was the initial major hurdle for adoption of this policy, as there was a lack of clarity among design professionals about what Universal Design actually meant for them and their work. Those advocating for the adoption of the concept often did so by offering examples “without concrete descriptions of requisite characteristics.”¹ Ultimately, this was not intuitive to many designers, and therefore was not an effective way of introducing a new concept intended to be widely applicable to all types of design work. In addition, it was difficult for proponents of Universal Design to advise designers on how to implement the changes needed to achieve the goals of inclusivity. Because of these limitations, it proved hard for designers

who were new to these concepts to make the leap from the examples provided to effectively integrating these concepts into their designs.

It quickly became clear that more supporting information and materials were needed if Universal Design was going to be widely adopted in the design world. For this reason, “a working group of architects, product designers, engineers and environmental design researchers”² (organized by Ronald Mace³ and funded by the US Department of Education’s National Institute on Disability and Rehabilitation Research⁴) was created to take Universal Design beyond a simple concept and develop a set of principles that follow from the definition. These principles elaborated on the concept of Universal Design, making it clearer, more easily applicable to all types of design, and more straightforward to teach to those interested in improving inclusivity in their designs. The new approach divides the key ideas behind Universal Design into seven principles that “may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.”⁵ The seven principles set forth by this group are the following:

1. Equitable Use
2. Flexibility in Use
3. Simple and Intuitive Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use⁶

For each principle, a series of guidelines offering more details was also created. These guidelines offer information on what designers need to do in order to achieve the principle to at least a minimal degree. They make the process of implementing Universal Design more approachable for all types of design projects.

Though not all seven of the principles apply to every project equally, they are all important considerations when designing for inclusion. Moreover, they each cover a distinct aspect of inclusivity. Taken together, they address the wide array of needs that users may have and clarify the specific considerations that apply to all different types of design work. They can be used to determine the priorities for newly designed projects and to evaluate existing products, spaces, and services to determine whether they are inclusive. Designers who strive for inclusion but are not sure where to start can rely on these principles to remind them of the needs of those who are most often forgotten and overlooked in the design process.

THE PRINCIPLES OF UNIVERSAL DESIGN

1. EQUITABLE USE

The design is useful and marketable to people with diverse abilities.



- GUIDELINES**
- 1a. Provide the same means of use for all users whenever not contraindicated.
 - 1b. Avoid segregating or stigmatizing any users.
 - 1c. Make all operations, safety, and security features equally available to all users.
 - 1d. Make the design appealing to all users.
- EXAMPLES**
- Provide clear paths to entrances that are convenient for all users.
 - Integrated, dispersed, and adaptable seating in assembly areas such as sports areas and theaters.

5. TOLERANCE FOR ERROR

The design minimizes hazards and the adverse consequences of accidental or unintended actions.



- GUIDELINES**
- 5a. Arrange elements to minimize hazards and errors; design objects, components, and controls to minimize errors that do not result in loss of data or damage to equipment.
 - 5b. Provide fail safe features.
 - 5c. Discourage uncontrolled actions in tasks that are critical to safety.
- EXAMPLES**
- A keyboard can be easily inserted into a recessed keyboard in surface of two ways.
 - An "undo" feature in computer software that allows the user to correct mistakes without penalty.

2. FLEXIBILITY IN USE

The design accommodates a wide range of individual preferences and abilities.



- GUIDELINES**
- 2a. Provide choice in methods of use.
 - 2b. Accommodate right- or left-handed access and use.
 - 2c. Facilitate the user's accuracy and precision.
 - 2d. Provide adaptability to the user's pace.
- EXAMPLES**
- Scissors designed for right- or left-handed users.
 - An automated teller machine (ATM) that has visual, tactile, and audible feedback, a tapered card opening, and a paper rest.

6. LOW PHYSICAL EFFORT

The design can be used efficiently and comfortably and with a minimum of fatigue.



- GUIDELINES**
- 6a. Allow user to maintain a neutral body position.
 - 6b. Use reasonable operating forces.
 - 6c. Minimize repetitive actions.
 - 6d. Minimize sustained physical effort.
 - 6e. Level or loop handles on doors and fixtures.
- EXAMPLES**
- Touch lamps operated without a switch.

4. PERCEPTIBLE INFORMATION

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.



- GUIDELINES**
- 4a. Use different modes (visual, verbal, tactile) for redundant presentation of essential information.
 - 4b. Maximize "legibility" of essential information.
 - 4c. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
 - 4d. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.
- EXAMPLES**
- Tactile, visual, and audible cues and instructions on a television.
 - Information available to both sight-impaired and hearing-impaired, such as stations, and subway cars.

7. SIZE AND SPACE FOR APPROACH AND USE

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of users' body size, posture, or mobility.



- GUIDELINES**
- 7a. Make graphs to all components comfortable for any user for any seated or standing user.
 - 7b. Accommodate variations in hand and grip size.
 - 7c. Accommodate variations in the use of assistive devices, such as a wheelchair.
 - 7d. Provide clear floor space around controls.
- EXAMPLES**
- Controls on the floor and clear floor space around ramps, mailboxes, dumpsters, and other elements.
 - Wide gates at subway stations that accommodate all users.

THE PRINCIPLES WERE COMPILED BY ADVOCATES OF UNIVERSAL DESIGN, IN ALPHABETICAL ORDER:

- Beyre Rose Corneil, Mike Jones, Ron Mace, Jim Mueller, Abri-Murick, Elaine Ostroff, Jon Sanford, Ed Stamer, Molly Story, and Gregg Vanderheiden.

NOTE: The Principles of Universal Design are not intended to constitute all criteria for good design, only universal usable design. Certainly, other factors are important, such as aesthetics, ergonomics, and usability, and all appropriateness, and these aspects must also be taken into consideration when designing.

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Figure 3.1. Poster summarizing the principles of Universal Design. Photo courtesy of NC State University, Center for Universal Design.

Thus, the core of Universal Design is these seven principles that seek to take it from a philosophy or concept and move it to a set of precepts. These principles were developed to be applicable in the design of physical spaces and digital designs as well as everything in between. They are intended to make the implementation of the ideals embodied by Universal Design more straightforward for designers at all levels of experience and in all fields. Rather than an abstract idea, these principles can serve as a step-by-step guide for the evaluation of design decisions throughout a project to ensure that inclusion is maximized at every point along the way. The principles can even be adapted into a checklist to guide design decisions and prompt specific considerations by teams of all types as described later in this book. By fully understanding these principles and learning how to incorporate them into the design process, it is possible to create designs that will be equally usable for as many different users as possible without the risk of exclusion or the need to make as many separate accommodations.

EQUITABLE USE

The first principle of Universal Design is that all designs should be equally usable by all potential users. The focus of this principle is on offering an equitable experience for everyone. While the ideal scenario is one where all can use the design in the exact same manner with the same result, where that is not possible, the design should allow for different types of use that result in equitable outcomes. This avoids a situation where users with a specific set of needs, preferences, or limitations are artificially separated from other users, and seeks to avoid the stigma and isolation that can result from this separation. Groups of users with a variety of needs should likewise be able to have a unified experience together, rather than needing to split up so that all may participate. This principle can be seen as a direct response to the frequency with which users with disabilities and those with other types of specialized or marginalized needs are physically separated from users who conform with the assumptions that the designer made in creating the space, service, or product. For disabled people, being separated (and missing core features of an experience) is all too common. The first principle of Universal Design acknowledges and seeks to redress the stigma that often accompanies the separation and isolation that comes from being excluded by design decisions, whether this exclusion is the result of a conscious decision or not.

This is not to say that any product will ultimately be entirely usable by every single potential user. As Mace himself noted, “I’m not sure it’s possible to create anything that’s universally usable. It’s not that there’s a weakness

in the term. We use that term because it's the most descriptive of what the goal is, something people can live with and afford."⁷⁷ As with other aspects of Universal Design, the goal is to consider and meet the needs of the greatest range of users rather than to find a utopian solution that will work for all. But even in cases where a design cannot offer an equal or equivalent experience for every potential user, it is possible to make decisions that lead to greater usability for more types of users.

Examples of Equitable Use in Action

When picturing what is meant by “equitable use” in Universal Design, it is perhaps best to start by picturing the traditional entrance of formal government buildings, such as the US Capitol Building. Often in the past, this style of buildings had grand staircases leading into their entrances, which offered an imposing and formal first impression to all who entered. Of course, with time it became clear that these entrances were not usable for many people. Whether a person uses a wheelchair, has other mobility limitations, is pushing a cart, or has a child in a stroller with them, stairs can be a significant impediment to entrance. To address this situation, many institutions installed ramps at secondary entrances. This served as an alternative for those who were not able to use stairs, but in the process separated these users from the rest of the public and deprived them of the ability to access the building through the primary entrance, which is often conveniently situated near significant services or other important architectural features. Another option some buildings adopt is to install a chair lift, which is a mechanical device with a platform that people who use wheelchairs can maneuver onto in order to be lifted to the top of the steps. While this allows individuals who use wheelchairs to access the main entrance, these lifts are often not usable by those with other mobility issues, such as those who use walkers, push strollers, or simply have difficulty safely walking up stairs. These approaches to accommodating disability also routinely result in separating disabled users from other users. For example, all too often the person in a group who uses a wheelchair must find and use a chair lift by themselves, and then find their way through the building to rejoin their companions at the main entrance. While these sorts of solutions might meet the bare minimum of accommodating certain types of disabilities and specialized needs, it is not an ideal situation.

The first principle of Universal Design instead suggests that the priority should be on making the primary entrance equally usable by all users no matter their needs. In the case of a staircase for an entrance, this could mean installing a ramp that replaced the staircase for all users or renovating the building to lower the entrance to allow for step-free access to the main door, so

that all users can enter the building together. It might even mean redesigning the space so that the secondary entrance that has been made accessible becomes the primary entrance. This approach would allow users equal access to the main entrance of the institution regardless of ability to use stairs.

Virtually everyone has encountered examples of this principle in their daily life. One of the most common, perhaps, is curb cuts that are found on the sidewalk at many intersections. While these small ramps were often initially installed as an accessibility solution for those who use wheelchairs or other mobility devices, they are equally helpful for those with carts and strollers, allowing them to cross the street without needing to step off the path everyone uses or attempt to navigate a curb with wheels. Today pedestrians may take curb cuts for granted; in reality they are a ubiquitous and very effective example of rethinking a design to accommodate users with a range of needs. Other common examples of equitable use include many types of automated fixtures, including doors, lights, toilets, and garbage cans. In the digital realm, websites and apps can also be designed with this principle in mind by conforming with web accessibility standards. An example of this is websites with high-contrast color schemes that are clear to those with low vision. Equitable use can even be implicated in the content of websites or other types of media. For example, educational content that integrates materials that are offensive or upsetting to users will not offer those users an equitable opportunity to make use of them. No matter what type of design project is being undertaken, this first principle helps to remind the design team of the importance of keeping the needs of a wide range of users in mind and respecting all users as equals.

FLEXIBILITY IN USE

One of the central tenets of Universal Design is the importance of acknowledging, and even embracing, the individuality of each person for whom a design is being created. This is often thought of in terms of disability, but it can mean far more than this. It recognizes that everyone has unique skills, specific needs, personal preferences, differing ability levels, and particular limitations that may change from situation to situation. Whether the special need is a result of having a disability, being left-handed, or being taller than the average user, the goal is for the design to flexibly respond to the needs of the individual so that a single design can meet the needs of an entire array of possible users. Critics of Universal Design sometimes argue that it offers a one-size-fits-all approach to design, but this principle suggests a possible way to avoid potential pitfalls. By focusing on including flexibility in the design,

it is possible to offer a unified experience that works for users with widely divergent needs.

The requirement for flexibility also recognizes that the needs of a single person may change over time. Users may not come to a product or space the same each time. Whether because they are distracted, injured, have their hands full, or experienced some other change to their baseline abilities, users will interact with an item differently each time they encounter it. Meeting needs caused by temporary changes can be even more important and challenging because users with short-term needs may not have developed the means to adapt to these changes to their circumstances (e.g., a person with a fractured arm or injured hand may require time to adjust to operating products and services single-handedly or with their nondominant hand). Offering flexibility and adaptability allows users to seamlessly proceed without being unnecessarily impeded by these varying needs.

Finally, flexibility allows a design to go beyond merely meeting a basic functionality to being an attractive and enjoyable experience for the user. By integrating flexibility and adaptability into a design, it is possible to offer users the chance to interact with the item in a way that matches their preferences. Flexibility in the use of a product can be subtle and not expressly acknowledged by users in many cases, but it will generally leave users with a more positive impression of the interaction if they are able to adapt it to their own preferred approach rather than having to adapt the way they work to the space or product. (Conversely, users will expressly recognize a design that is not flexible and causes them significant frustration as a negative experience.) Moving from merely functional to actually enjoyable and engaging is an important element of creating a design that will be memorable and bring users back time and time again, so this principle can offer vital insights into offering designs that attract and retain users on an ongoing basis.

There are many different ways flexibility can be incorporated into design. In some cases, it may refer to physical reconfiguration of an item, by incorporating materials that can bend and adjust or items that can be increased or decreased in height for different sizes and postures (to permit users to interact with an item from a standing or sitting position). However, flexibility also refers to designing in a manner that allows the users to make significant and meaningful personal choices about how to use the item or interact with the space. Beyond mere physical flexibility, it includes offering multiple modes of engagement, so users can adjust the interaction to their own skill level, speed, and ability. This is particularly important to keep in mind in digital and educational environments. At all points in the design process, the goal should be to incorporate means of personalization and responsiveness to ensure that

each user will be supported in the way that they need or prefer to interact with the item or environment.

Examples of Flexibility in Use in Action

Flexibility in design is truly all around and is often taken for granted as part of good design. One area where flexibility is increasingly common and appreciated is household tools. This can be seen in simple objects like scissors that work equally well for both right- and left-handed users, but it can also reflect design choices that introduce flexibility to an entire line of tools. An excellent example of this is the award-winning Good Grips line of kitchen products from OXO. Initially designed for users with arthritis,⁸ this line features thick rubbery handles that are flexible enough to be gripped in different ways and require different amounts of force by different users. Not only do these tools serve the needs of people with arthritis as originally intended, but they have also grown to be extremely popular with chefs and home cooks of all kinds. The innovative design was notable enough for the Museum of Modern Art (MoMA) in New York City to add it to their permanent design collection.⁹ This design recognizes not only the users' differing ability to hold the items with this style of grip, but also individual preference on how to hold and use kitchen tools. Flexibility to respond to individual preference abounds in design work that is based on the results of user-experience research, but it is important when looking at these examples to consider whether they are adequately inclusive in considering a broad range of types of potential users. One of the reasons that OXO's work is so impressive is because it considers the needs of often-overlooked groups while also creating a tool that is preferred by a wide range of users.

Another common example of flexibility is adjustable office furniture that permits users to optimize their experience ergonomically. Anyone who has used an office chair that allows users to customize the height, tilt, and width of the chair has seen an example of Universal Design. These pieces allow each user to set up their work space in a way that meets their personal preferences and physical needs, accommodating those of various heights and sizes with a single product. Similarly, desks that can adjust between standing and sitting heights offer another way for users to have the flexibility to have an office design that works best for their personal preferences and that can be changed if their needs or preferences shift over time.

Flexibility in use also features prominently in safety and accessibility features. Offering railings on both sides of a staircase or grab bars on both sides of a toilet meet the needs of users who are right- or left-handed or who may only have the use of one arm. Often for design or cost reasons, the decision



Figure 3.2. Ambidextrous scissors manufactured by Fiskars®.
Photo courtesy of NC State University, Center for Universal Design.

is made to only include these features on one side, but it is important to consider what the full implications of this choice may be, particularly if the same side is selected for every staircase or bathroom. A similar example also seen in public restrooms is the choice of where to place baby-changing stations. While in the past it was almost universally true that these were only found in restrooms designated for use by women, increasingly they are placed in restrooms designated for use by men and gender-neutral restrooms to offer flexibility for use by more individuals responsible for childcare.

In a digital environment, this principle can be seen in tools that allow users to set their own pace and customize features like color and font size. Additionally, the ability to set persistent personal preferences on devices and apps allows users to customize the way that they interact with these tools to meet their own specific abilities and preferences. This can mean changing the size of text on a mobile phone or having instructions pop up in the user's primary language rather than simply the default language. With an increase in the use of digital technologies and the addition of more features, there is an increasing expectation that this type of customization is available to streamline and optimize the user experience for all users, not just those with disabilities. This in turn is poised to change the degree to which users expect their offline environment to accommodate their preferences as well, making this principle even more important for modern design projects.

SIMPLE AND INTUITIVE USE

One of the primary goals in the design of many products is ease of use, to make the product more appealing to users. The principle of simple and intuitive use is focused on ensuring that this is the case. It reminds designers of the importance of making design decisions that simplify how the item is used, whether referring to how a visitor navigates through a space or how a person uses a tool. Specifically, items should be designed so that users of all experience levels, communication skills, language abilities, backgrounds, and levels of concentration are able to use the item easily and correctly. This is often an unattainable goal, but the focus should be on creating an item that is intuitive to use and does not require a great deal of training or explanation. This principle not only improves the outcomes for users with cognitive disabilities, but also ensures that users who are unable to read instructions (e.g., due to a language barrier, visual impairment, or attention deficits) are able to have a successful interaction with the product or service. Moreover, a significant number of users of nearly all products may use the product in some cases while distracted, and simple and intuitive designs will satisfy their needs as well and minimize frustration and/or negative experiences.

Often this principle is best served by streamlining a product. The features of an item should avoid complexity and minimize unnecessary decisions on the part of the user. The expectations should also be consistent throughout the experience and fit with general expectations for that field. An example of this is the way that the hot and cold water controls are generally found on the same side of the faucet in many parts of the world. Flouting these sorts of conventions can lead to confusion and generally requires more thought and consideration from users when they use the item (e.g., a nonstandard arrangement of hot and cold water faucets may lead to frustration on the part of users or, at worst, bodily harm with scalding hot water).

Though this principle is an easy one to articulate, in practice it can be very difficult to successfully achieve. One of the reasons for this is that a design that is intuitive to one person may be confusing to another, particularly if they come from a different background and have different experiences. It can be particularly challenging for a designer who has familiarity with the product to put themselves in the shoes of an inexperienced user presented with their product for the first time. More than the other principles, therefore, designing simple and intuitive solutions relies on the ability of the designer to be empathetic to users (and their lack of specific experiences) and to define the potential user group as broadly as possible. In some cases, designing an item that adheres to this principle may require designers to work directly with a wide range of users from a variety of backgrounds and points of view to

ensure that the ultimate solution is truly simple and intuitive. Designers also frequently face the temptation to add additional features to their product to make it more appealing and competitive, but in the process sacrifice simplicity and ease of use.

Examples of Simple and Intuitive Use in Action

It can be easy to overlook examples of this principle in the world since intuitive products are often the ones that users give the least thought to, but everyone encounters many examples of this each day. One such example is the way that number pads in a variety of settings from telephones to elevators are arranged in numerical order and laid out in an easy-to-follow design, which helps users to quickly adjust to any number pad they encounter and accurately use it without the need for lengthy review. Similarly, the QWERTY keyboard is dominant for Latin-script languages more because it has been consistently used for years and has grown to be expected than because it is the most efficient possible layout of the letters. The benefit of the system is that anyone who has used one QWERTY keyboard can type at another one (in the same language layout) with relative ease and confidence. If the letters on each keyboard were different, touch typing would be impossible or significantly less efficient at new machines. This concept of meeting the users' expectations is a key element of intuitive design.

A piece of simple and intuitive design is also incorporating straightforward prompts and instructions that are understandable by users of varying levels of knowledge, ability, and experience. This can be seen in everything from the step-by-step setup tutorials that automatically pop up on laptops and cellphones to the way that many appliances have basic instructions or preset features incorporated into the user interface (such as the popcorn button on many modern microwaves). Another common example of this is in the pictogram instructions that come with flat-pack furniture to guide the assembly process. Generally combining both written and pictorial instructions on each step of the process and sometimes even featuring multiple languages, these instructions are usable by even those who are new to setting up furniture and accommodate those who cannot read the text. These features level the playing field for those who do not have past experience with the equipment and offer a better user experience for all ability levels.

Safety equipment is often designed with this principle at the forefront because it is used at a time when people are under stress or otherwise distracted. Single-button alarms or panic buttons are an excellent example of a design that is simplified down to a single easy-to-understand purpose. Another example of this design concept is seen in the automated external defibrillators

(AEDs) that are increasingly available in public venues. These machines are meant to be used by individuals with minimal or no training to respond to medical emergencies, so they offer a combination of redundant audio and visual instructions to walk the user through the process quickly and efficiently. They are also streamlined to limit the number of options and inputs available to cut down on possible error points and bolster the confidence of users in a high-stress situation. Though all of these examples are very different, what links them is an effort to make use of the item easier by meeting user expectations and intuitions and providing support for their varying levels of knowledge and ability throughout the process of using or interacting with the item.

PERCEPTIBLE INFORMATION

Ensuring that the information users need is conveyed in an easily perceptible manner may seem like an obvious feature of good design, but unfortunately it is still often overlooked. This principle dictates that any necessary information should be offered in a way that will be comprehensible by varied users. To accomplish this, designs might include text, pictures, audio, and a tactile means of interacting with the item. It also means that any text must be actually legible, meaning that it should be sufficiently large and in high enough contrast with the background to be readable from the expected distance of use by those with low vision. Additionally, information should never be conveyed solely through color, because users may have difficulty perceiving color due to the lighting in the space or their own vision. Instead, information that is conveyed with color should also be perceptible in another manner, such as through the design or text on the object. While many designers automatically think of one or two of these ideas, the important part is to ensure that multiple different modes of perceiving the information are available so a wide variety of users can interact with the item on equal footing.

Another part of making the information perceptible is also designing the item so that it is possible to give clear information about its use. This might mean using buttons with different colors and designs on them or using pieces of different sizes and shapes. The goal is to have features that can be clearly differentiated from one another and can be described either verbally or in writing in a manner that is clear to a range of users.

The principle addresses not just differences between users, but also differences in the environment in which the item is used. While high contrast between the background and the text on an item may be valuable for those with low vision, it is also helpful when the area around the object is poorly lit. Similarly, tactile information can be useful in situations where the item might

be lowly lit or when the user will have to reach out and touch to use, thereby obstructing any visual information that might appear on the item.

In a digital environment, adherence to this principle requires that content be accessible to users who use various assistive technologies. Websites, apps, databases, and all other digital content should be compatible with screen readers, navigation with the tab key, and specialized assistive tools. It also means that the requirement that content be high contrast and not use color as the sole means of conveying information also extends to the digital realm. Many of these steps are required for digital content to comply with accessibility laws, but problems nevertheless persist, so it is important to specifically incorporate these ideas into the design process and test for them when evaluating or working with finished products.

Examples of Perceptible Information in Action

Fortunately, there are many examples of this principle being used in the public sphere. Common examples are the inclusion of Braille in public spaces, particularly as seen in most elevators, and the use of icons as well as words to differentiate between men's and women's restrooms. Another example that may be less noticeable is the fact that traffic lights not only use colors to convey necessary information but also position. The red, yellow, and green lights are always in the same order to make the information perceptible to those who are color-blind. Any time a train station or airport makes audio announcements with information that is also contained on the visual displays, they are also following the guidelines of this principle and ensuring greater usability and accessibility. The machines in public transportation hubs also



Figure 3.3. The Rubik's Touch Cube is an example of offering multiple ways of perceiving information.

Rubik's Cube® with permission by Rubik's Brand Ltd www.rubiks.com.

often offer a combination of visual, audio, and Braille cues to ensure that all users can independently make use of them.

There are also many products that are designed with this principle in mind. Most computer keyboards not only have information about each key visually represented in a high-contrast way on the key, but many QWERTY keyboards also have a tactile element on the F and J keys, which allows users with visual impairments to orient themselves on the keyboard with greater ease. Virtually all televisions also include features that ensure that information is perceptible to all, including a decoder that allows them to display closed captions transmitted with television programming. Now that much of the content that previously appeared on broadcast television is moving into streaming services, those services also offer closed captioning and, for some of their content, audio descriptions, which is a separate audio track which describes important visual events as they happen so that visually impaired viewers can have a more equitable experience watching the program. In addition, some toys incorporate tactile elements that correspond to colors so that they are equally usable by visually impaired people. A great example of this is the tactile Rubik's Cube, which not only has squares of different colors, but also has a different raised shape for each color so that everyone can play with a single version of the toy. While it is great that so many examples of this principle exist in many different environments, there is still room for improvement, especially when it comes to new designs. This is a principle that impacts the user experience of a large number of users, so it is important to make it a central part of the design process.

TOLERANCE FOR ERROR

When interacting with an item or environment, it is important to design such interaction to prevent users from making significant mistakes and include built-in safeguards to minimize the impact of any errors that users might make (i.e., design items and environments to be as foolproof as possible). This can encompass ensuring that mistakes and improper usage of the item will not result in danger or personal injury. But beyond that, errors should not lead to significant adverse impacts, there should be easy ways to reverse or correct for accidents and errors, and, if non-reversible, the results of mistakes should be as minimal as possible.

The approach to this principle can take several different forms. First, and perhaps most vitally, hazardous outcomes should be eliminated. If not possible, any features that can cause hazardous or problematic outcomes should be difficult to inadvertently trigger. As an example, some elevators put the alarm button to be used in case of an emergency directly adjacent to the eleva-

tor call button. This design makes it more likely that users will make mistakes with significant adverse impacts; tolerance for error would guide designers to reconsider this design choice or ensure that if the user inadvertently pushed the alarm button, they had a way to cancel the action before it had a significant impact.

Another approach to this principle is to prevent the action entirely, or, if the action needs to be available under certain circumstances, provide clear and effective warnings for the user before they take an action that might have an adverse impact. These methods are particularly effective in an online environment, where they are often seen in the form of pop-up messages or the need to confirm a course of action before content is deleted or modified, and autosave features that can reverse inadvertent deletion of content. The design can also take the approach of encouraging the user to pay greater attention to their actions to minimize unintended actions and consequences. All of these approaches protect users from experiencing negative impacts from any errors they may make as a result of their being distracted, unclear on the actions required of them, or unable to reliably interact with the item. At the same time, designers must find a balanced way to use warnings and alerts judiciously to prevent “alarm fatigue” where users become overwhelmed as a result of too many alarms and begin to ignore them or just “click through” warnings without reading them.

Examples of Tolerance for Error in Action

This principle actually may be one of the most prevalent in the design world though it is one that users likely overlook on a regular basis. This is because users may not appreciate hazards not seen, as so many common design features have a goal of minimizing hazards or the impact of mistakes broadly defined. For example, railings on staircases and ramps are a safety feature that minimizes the impact of a misstep. Another common example is the way that many heated appliances such as heating pads, irons, and space heaters turn off if overheated or used in dangerous settings. These are seen as safety features in most cases, but they are also excellent examples of how designers can minimize the impact of user error.

Features that minimize the impact of errors also abound in the online world. In addition to the pop-up messages and autosave features mentioned above, tools such as the ability to undo edits, the requirement to confirm certain activities (such as deleting a file in the computer’s trash), and forms that reject content in an incorrect format prevent users from making errors that might have a significant impact on their work. In fact, commonly used tools such as autocorrect, spell check, and grammar check are examples of measures that can minimize and correct even minor errors that a user might make.

Another approach to tolerating mistakes is clear signage and guidance. Any item that has clear and effective warnings integrated into it is an example of this principle. This is often seen in the signage on moving sidewalks and escalators, but it can also be the case with any product from office equipment to household chemicals. Though this principle may be the one that is most prevalent without the need for Universal Design–focused redesigns, it is still a vital one to keep at the forefront of all design processes. This principle can have significant positive impacts on the user experience, from making products more usable for those with mobility impairments that limit their fine-motor control to cutting down on the frustration of users who make preventable mistakes for any number of reasons.

LOW PHYSICAL EFFORT

At its core, the principle of low physical effort is about designing items for efficient use with minimum effort. The goal is to lower the burden on users, in order to enable a greater number of users to independently use the item in question. Designs should be focused on being comfortable to use by those of varying sizes and strengths. In particular, designs should not cause an unnecessary degree of fatigue or require the sustained application of force. According to the guidelines associated with this principle, the design should “allow users to maintain a neutral body position”¹⁰ while using the item, which means that they should not have to contort their body from a comfortable resting position to use the design in question. Given all the elements of physical effort that are implicated in various designs, it is hardly surprising that this is a principle that applies in many different settings, from physical spaces to the digital realm to the design of consumer products.

Examples of Low Physical Effort in Action

A wide range of technologies can be used to lower the physical effort necessary to complete various tasks. In physical spaces, this can mean decreasing the force and dexterity necessary to complete tasks. One common example that is seen in many different spaces is lever doorknobs that only require users to push down on the lever rather than spherical knobs that require users to be able to grasp, turn the knob, and continuously push or pull to open a door. Lever doorknobs can be opened with an elbow if the user has their hands full or does not have full use of their hands, which has made them popular with a wide range of users. Another example is that of doors that open at the push of a button, a common accessibility feature that is particularly helpful



Figure 3.4. Fist pushing down on a lever door handle demonstrating that it does not require the strong grip needed by a round doorknob.

Photo courtesy of NC State University, Center for Universal Design.

for people who use wheelchairs or crutches who might otherwise have difficulty simultaneously exerting the force necessary to push open a door and maneuver through it, as well as for people who are pushing carts or strollers.

This principle can also apply to the digital world. Voice-to-text technology allows users to avoid the repetitive motion of typing and also accomplish work while their hands are otherwise occupied. As this technology grows in accuracy, it is a huge boon to those who previously would have had to type frequently for their job, leading to a higher risk of hand and wrist injuries. It is also increasing safety by allowing hands-free use of mobile devices while driving. For those with limited mobility, gaming controllers that rely on switches (instead of an elaborate series of buttons and thumb-operated D-pads) can make it significantly easier to play a wide range of video games.

Another common example of this principle is the types of household gadgets that are often mocked as being made for lazy people. Tools like the sock slider, which makes putting socks on easier for those with limited mobility, and low-force jar openers are often mocked in the media and online,¹¹ but

in reality they are important tools for users with many types of disabilities and excellent examples of Universal Design in action. While they may seem superfluous to those who have never had trouble with mobility, these tools lower the force or flexibility needed for many activities that are taken for granted by those without mobility impairments. As Greg Hartley, a board-certified geriatric clinical specialist at the University of Miami, noted in an interview with *Vox*, “These little things can make huge differences in people’s quality of life, enabling them to be independent and have a sense of self-worth.”¹²

As these examples show, this principle can have a significant impact on users, making their lives more convenient and productive (even for users who do not identify as having a disability) and offering independence to those with decreased flexibility, manual dexterity, or strength. It can change the way people participate in leisure activities and the way that they move through the world and access spaces.

SIZE AND SPACE FOR APPROACH AND USE

Users come in all shapes and sizes. While most designs focus on the average user, it is important to remember that many users will be taller, shorter, larger, or smaller than the average user. In fact, the majority of users will not necessarily conform with the average. Some users also use assistive devices to interact with their environments. These devices might require additional clearance or necessitate different angles of approach for common tasks. In particular, individuals who use wheelchairs require components and features that can be used from a seated position just as easily as they can be used when standing. Other individuals may have service animals or personal assistants to help them navigate their environment, necessitating enough space for the animal or additional person to stay beside the user. Beyond various types of assistance, some users may also be accompanied by children and either need space for strollers or have a desire for the child to also be able to navigate the space independently and safely. Given all of these potential use cases, it is important for designs to work not only for those who are of average size and shape but all users or even multiple users working in tandem.

In addition to being thoughtful design, this area of design is (at least in part) covered by legislation, such as the ADA in the United States. Disability antidiscrimination laws often have specific requirements about the size and shape of accessibility features such as the width of doors and ramps and the height of counters. Unfortunately, often there are provisions that permit a compromise where these features are available separately as an accommoda-

tion for users with disabilities, rather than incorporating them into the cohesive design of a space.

This is a clear example of how the principles of Universal Design can address these suboptimal solutions and offer a superior alternative to meeting minimal legal requirements. The principle of allowing the necessary space and sizing for approach and use, taken together with the principle of equitable use, demonstrates the importance of designing central features and service points to allow access by users of all sizes and those who rely on external tools or are accompanied as they move through their daily routine. This ensures that no user is stigmatized or separated from other users as they use the space. It also ensures that users can maintain their independence rather than having to rely on others to access areas that do not fit their needs.

Designing to ensure that spaces and fixtures are widely usable involves both providing adequate space (to avoid crowded areas and tight corners) and also offering flexibility and the ability to adjust the space and fixtures where possible. This principle extends to furniture selection, as offering furniture of a variety of different sizes and shapes—or, even better, furniture that can be adjusted by the user—can provide a customized and comfortable experience for all users. One must bear in mind, however, that if fixtures and furniture are adjustable or movable, it is important to regularly reassess the space and arrangement to ensure that the standards of usability have been maintained. All too often furniture is moved or temporary displays are set up in ways that may end up blocking the space for some users.

Examples of Size and Space for Approach and Use in Action

Examples of the importance of this principle abound in virtually all physical spaces. Many of these examples are situations where the design simply cannot accommodate size and mobility differences. A quintessential example is airplane seating, which generally is not able to adapt to the needs of travelers of varying heights, sizes, and postures. This is hardly the only example though. In daily life, it is common to encounter features that are designed with only a narrow band of sizes and shapes in mind. Everything from grocery store shelves to service desks to restaurant tables are designed for average customers and single out or exclude those who do not fit into this category. Even years after the concept of Universal Design was first developed, this remains a pervasive problem that most people look past multiple times a day as they navigate public spaces and services.

Fortunately, accommodating varied sizes and shapes is fairly straightforward if it is incorporated early in the design process. As a result, examples of well-designed spaces that satisfy this principle are slowly increasing. Service desks

and counters with varied heights are becoming more popular at places such as hospitals, airports, and government offices. Similarly, retail spaces increasingly understand the importance of ensuring that aisles and displays allow adequate space for easy navigation for all users, though many stores still struggle with displaying items at heights that are not accessible for those of varied heights and postures. While it is important to note that some of these changes are, at least in the United States, due to the requirements of federal legislation such as the Americans with Disabilities Act (ADA), there is also a greater awareness of the fact that many users and consumers do not fall within the narrowly defined norms that architects and designers focused on in the past.

Together, these principles give guidance for the application of the concept of Universal Design to concrete design projects of many sorts. Though in some situations, only a few of these principles will be relevant to a particular design, a key element of the process is considering all of them in a comprehensive manner. Together, these principles create a framework that helps to ensure that finished designs of all sorts are usable for the widest spectrum of users, and ignoring any one of them can seriously impact the final result. These principles are designed to provide guidance to meet the needs of a diverse set of users in a wide array of settings. When rushing to meet a deadline or under pressure to cut costs, it can be tempting to focus only on a few of the principles that seem best suited to the particular situation, but without a careful, formal evaluation of each of these principles, the needs of some users will inevitably be overlooked. For that reason, these principles should serve as the backbone of any design project that is undertaken.

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Chapter Four

The Limitations of Universal Design

Though Universal Design has grown in popularity over the years since its inception, it is not without its detractors, and there are legitimate criticisms that can be leveled against this approach to inclusion. Some of these critiques have to do with ways that Universal Design can be misapplied, with the result that the needs of marginalized groups in the community continue to be overlooked or subsumed to the interests of the majority. There are also concerns that the approach can be too narrowly focused on issues related to disability, or even only specific types of disabilities (e.g., catering only to individuals with physical disabilities). Conversely, some critics argue that the Universal Design approach to disability leads to a one-size-fits-all solution that does not truly meet the needs of many individuals with disabilities and other unique needs. In addition, because Universal Design emerged from architecture and industrial design, other designers, including web designers, feel that it does not properly address their contexts. These criticisms have slowed the adoption of Universal Design in some fields and have spawned alternative approaches to address the perceived gaps in its application.

Despite the fact that skepticism about Universal Design comes from several different avenues, many of those who question the approach share the concern that it is not as all-inclusive as it aims to be, both in terms of the types of users that these designs serve and in terms of the fields of design to which it can apply. Those interested in Universal Design need to understand these criticisms to make an informed decision about how to apply the principles and to ensure that their use and application will be structured in a way that minimizes these potential pitfalls. Taking into account the feedback offered by these critics can help to strengthen and refine Universal Design and ensure that it is being applied in ways that are more effective.

CONSUMER PRODUCTS TO THE EXCLUSION OF ALL ELSE

For some critics of Universal Design, there is a fear that it focuses too much on fancy tools and objects at the expense of other approaches to inclusion. While the OXO products mentioned may be a quintessential example of a universally designed item, some might question whether such an item does not create problems of its own, whether these are related to consumerism or simply a failure to encourage the development of other solutions that might be even more effective. As Sara Hendren puts it, “Universal Design . . . tends to stoke an unquestioned faith in the importance of *products*, attained by *consumers*, as the key to building a desirable world. A ‘better mousetrap’ may mitigate barriers in the short run, but sometimes it’s a better process, or a better system, that’s called for to lessen the conditions of misfitting meaningfully.”¹ While this critique may fairly be applied to the manner in which some companies and institutions implement Universal Design, it does not necessarily represent the true limitations of its application. While the principles of Universal Design can and often are applied to physical products, they are more broadly applicable to any type of design, including the design of new systems, processes, educational approaches, environments, and much more. Advocates for Universal Design must continue to advocate for this broad application so that it does not become pigeonholed as merely a technique for use in product design, but is instead allowed to reach its full potential. This criticism then may be less a reason to reject Universal Design and more a call to continue to push the boundaries of its application in new directions that will ensure that it does go beyond merely another way to market products.

ONE SIZE MAY NOT FIT ALL

One of the central criticisms of Universal Design is that the concept suggests the possibility of a one-size-fits-all solution for design problems. The concern is that in trying to find a single response that will fit all users, the needs of those with specialized needs and preferences will be overlooked or ignored. Thus, a design that is touted as inclusive will be exclusionary of those who do not fit within the expected bounds considered by the designers, even if those bounds are somewhat broader than has previously been the case. While the number of people excluded may shrink, it will never be reduced to zero. Worse yet, the needs of some groups may be regularly prioritized over those of other groups, resulting in the needs of those with disabilities falling to the wayside in the name of accommodating other members of the community.

Even if the focus remains on designs that will be inclusive for those with disabilities, it may be that the needs of those with more common types of needs (such as those who use wheelchairs) might dominate the design process and attention to the exclusion of those with less frequently encountered needs.

This has prompted some to describe Universal Design as a “utopian” view of design,² with some, such as Myriam Winance, arguing that it would be preferable for Universal Design to “abandon its claim to universality”³ entirely. Others have pointed out that this problem demonstrates that for Universal Design “there is some danger here of falling into what critical race theorists would call interest convergence—the idea that conditions for a minority group improve only once the effort can be justified as helping the majority as well.”⁴ Surveying architecture educators, researchers have found that “some view the topic as rather unscientific: it is considered to be a set of good intentions, but rarely surpassing that level. . . . This is in line with the general critique that UD is utopian, and that it is impossible to really design for everyone, so designers can only strive to limit the damage.”⁵ While there are practitioners who have dismissed this criticism as a “branding issue,”⁶ it is worth serious consideration because this perception has slowed the adoption of Universal Design and led some to view the concept with suspicion. In addition, if this criticism proves true, it would represent a serious failure to achieve the stated goals of Universal Design.

Moreover, it is an unfortunate reality that projects can nominally apply the principles of Universal Design in ways that do not materially achieve its goals of inclusion. In fact, this is an issue that Ronald Mace himself anticipated, saying, “The term universal is not ideal because nothing can be truly universal; there will always be people who cannot use an item no matter how thoughtfully it is designed. However, we can almost always improve on the things we design to make them more universally usable.”⁷ Thus, this is a potential issue that must be addressed each time one is applying the principles of Universal Design to a project to ensure that the result, as stated in the definition of Universal Design, is “usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.”⁸ However, while this does point to the possibility that Universal Design is a misnomer, it is not a sufficient reason to reject the principles and goals of Universal Design outright. It may be true that no design is ever truly universal, but it is important not to allow this to prevent innovation and improvement that advances the goals of inclusion and accessibility. As Ann Heylighen has argued, “The impossibility to really design for everyone . . . is inherent to design rather than characteristic of universal design.”⁹ Instead of using this fact as a reason to reject the concept, it should be used to highlight the care that must be taken when applying the principles. By acknowledging this potential limitation

early in the design process, it is possible to take steps to address it as further discussed below.

PLAN FOR ACCOMMODATIONS

Related to concerns that Universal Design represents an unattainable utopian goal is the concern that applying Universal Design can lead to the incorrect assumption that the end product will meet everyone's needs without any additional accommodations. Even if a space is designed to be usable by the widest number of people possible, there is no solution that will truly work effectively for every person. Each person has specific needs, a fact that is, if anything, even more true of disabled individuals who may have a unique set of needs that have not been, and cannot be, fully anticipated by the designers. This can lead to one of the issues that many critics see in Universal Design as it is applied to real-world situations. As Richard Godden explains, "In practice the drive for universalism obscures the embodied particularity of individuals."¹⁰ This is not so much a limitation of Universal Design as it is an important reminder of what design can achieve and what it cannot. No design will be able to equally meet, or fully anticipate, the needs of all users. This is an important limitation of Universal Design, but not a reason to reject it out of hand. Instead, it points to the importance of balancing these principles with other approaches that address the needs of users. Universal Design can never be the sole solution to all accessibility considerations. Instead, it is a supplementary approach that focuses more on usability and inclusion than on meeting legal accessibility requirements for accommodations.

Though written with a specific focus on digital humanities, Godden's statement that "I do think we need to move forward by balancing the Universalist and utopian aims of UD with a more local, attentive approach to individual use"¹¹ is one that has broader application. It is vital that Universal Design not be seen as a replacement for individual accommodations and provisions for unique needs that are not addressed by the design process. Though one of the allures of Universal Design may be cost savings with respect to accessibility accommodations, it is important not to overestimate this impact. Both monetary and staff budgets should take into account the fact that individual accommodations will still need to be provided and procedures should not start with the presumption that a universally designed space, service, or other offering is one that can be fixed at the moment of its conception, fully accessible to all, with no further work or investment of resources. Universal Design may ultimately decrease the number of individual accommodation

requests received, but it will never replace offering individualized options for some patrons.

NOT ALL DESIGNERS EMBRACE DIFFERENCES

Avoiding a one-size-fits-all and planning for accommodations is, at its core, adopting the Universal Design premise of rejecting the idea of a “normal” user in favor of embracing the natural differences between users. No two people are ever alike and the idea of “normal” is one that is always, by its nature, putting others in the category of “abnormal.” When done incorrectly, Universal Design attempts to ignore, minimize, or reject what is unique about each person. But these approaches to design will always fail to be truly universal. Unfortunately, this is a limitation of Universal Design because it is frequently applied in ways that seek to draw attention away from not only disability but all aspects of the individual that make them unique rather than celebrating those differences. As Jay T. Dolmage notes, “For Universal Design to be truly successful, it must do so without claiming to erase embodied difference.”¹² Universal Design should embrace and in some cases even highlight each user’s differences as it seeks to also cater to those differences. It should seek to create designs that will bring many different users together across different sets of needs, different backgrounds, and different lived experiences. As long as this is ignored in the process of applying Universal Design’s principles, its goals cannot be fully achieved.

INVOLVING A WIDE RANGE OF USERS IS THE KEY TO SUCCESS

One reason why Universal Design is often seen as a one-size-fits-all or as an otherwise unsuccessful approach to accessibility and inclusion is because designers struggle to effectively implement the principles. Often this comes down to an inability to fully understand the needs of users. As one critic of Universal Design, Jane Bringolf, put it, “Universal design is difficult to put into practice because designers have no experiential reference point from which to begin their thinking.”¹³ The reality is that the design team for most projects is unlikely to match the diversity of the community of users for which the design is being made, and the intended audience for the design project is often not integrated into the creative process.

Because of this, “users’ are often positioned in problematic ways in UD accounts, with technical representation of bodies and mobilities featuring promi-

nently while the capacity of ‘non-professionals’ to materially shape decisions and outcomes remains by-and-large absent.”¹⁴ The users’ characteristics may be discussed throughout the design process, but their actual needs are often misunderstood and the users themselves often do not have clear means of asserting an influence on the process. This is frequently at the heart of many major design problems, whether or not Universal Design is applied to the process.

The solution to this problem is to find better ways to involve diverse representatives of the community in the design process. As Inger Marie Lid notes, “In political and democratic processes, embodied knowledge is included by involving user-representatives in planning and design processes. A person using a wheelchair has knowledge of accessibility and barriers from a first-person perspective, situated, embodied knowledge. As a wheelchair user this person perceives the social and spatial environment as his or her environment. Such embodied knowledge is valuable for both academic and practical involvement in UD.”¹⁵ Ultimately, this extends beyond individuals with disabilities. Users from various ages, ethnicities, abilities, backgrounds, socioeconomic groups, and more should be involved in the design process from start to finish to ensure that their unique knowledge is integrated into the decision-making process. This process can break down existing preconceptions and stereotypes and ensure that the final design avoids a focus on designing for an average or “normal” user.¹⁶ The involvement can take the form of a mix of surveys, focus groups, postlaunch user testing, and inviting members of the community to serve as part of the design and decision-making team for large-scale projects.

Even after a design project is thought to be completed, it is vital to maintain a process for feedback and an ethos of ongoing improvement. As Jay T. Dolmage notes, “A critique of universal design would point out that there is no built-in process for collecting feedback from users, thus no way to ensure that those who inhabit the designed space have an active role in its reconstruction.”¹⁷ This is vital to ensuring that the design will remain accessible, as needs may evolve over time. It also goes hand in hand with building in an acknowledgment that accommodations will still be required even if a space, service, or program has been created by applying the principles of Universal Design. The key is to ensure that the input is solicited from a diverse group from the community who can offer insights into the lived experiences of the intended users for the project.

MAINTAIN A SPACE FOR EXPERTS

While gathering user input is vital, it is equally important to maintain a clearly defined means of filtering that input through the lens of design exper-

tise. Users can provide key insights, without which it may be difficult or even impossible to design successful projects. However, they are not themselves designers and, therefore, cannot necessarily translate their insights into design decisions. They might be able to develop suggestions of how their own needs can be met, but they likely will not be able to come up with the creative solutions necessary to solve the problems of many users within a single project. The key is to find workflows that connect the feedback from users with designers who are able to translate the insights about the users' personal experiences and individual needs into design solutions that respond to the needs of an entire community. Finding the balance between meaningful opportunities for users to influence the design process and a continued reliance on the skills and expertise of designers will allow for new solutions that transcend what either group could produce individually.

UNIVERSAL FOR WHOM?

Another criticism of Universal Design is that it is all too often applied in a way that fails to take into account other dimensions of the users, in particular those that lead users to be socially marginalized. Applications of Universal Design that fail to consider any aspect of the user other than their disability fail to be truly inclusive. "Intersectionality" is a term coined by Kimberlé Williams Crenshaw in her highly influential 1989 work entitled "Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics." Crenshaw argued that antidiscrimination efforts "focus on the most privilege[d] group members" which "marginalizes those who are multiply-burdened and obscures claims that cannot be understood as resulting from discrete sources of discrimination."¹⁸ Since its development, intersectionality has served as "a compelling critique of this group unity equals group uniformity logic."¹⁹ Despite the fact that disability has not always been explicitly included in discussions of intersectionality,²⁰ scholars, particularly those in the field of disability studies, have argued that disability should be considered as "a critical category in discussions of intersectionality."²¹ As a device for focusing on the full spectrum of differences between members of any community, an understanding of intersectionality is vital to a meaningful application of the principles of Universal Design.

Though Universal Design's own definition and principles evince a goal of inclusivity, too often the reality is one that focuses on the most privileged group members just as Crenshaw notes with respect to other types of antidiscrimination work. In order to be successful and achieve a meaningful level of inclusivity, those who apply the principles of Universal Design must ensure

that their efforts are intersectional, in an approach that, as Akemi Nishida says, “enables the acknowledgment of our multiple identities as well as the ways in which various social injustices are intertwined and interactively affect our daily lives.”²² It must address not just design that is exclusionary on the dimension of ability, but also design that excludes on the basis of race, ethnicity, class, sexual orientation, gender, age, and other types of social marginalization. It is key that the aim of a “universal” solution not be applied in a way that excludes those with specific types of marginalization or with multiple axes of marginalization from consideration. Just as Universal Design rejects designs that exclude those with disabilities, it must also reject designs that do not take into account the reality that many individuals experience multiple, simultaneous types of exclusion, oppression, and rejection. Without adopting an intersectional approach to this work, it is impossible to achieve a meaningful level of universality.

INCLUSIVE DESIGN VERSUS UNIVERSAL DESIGN

While some have argued that the terms “Universal Design,” “Design for All,” and “inclusive design” all have the same basic meaning,²³ and others have stated that the difference is primarily one of geography,²⁴ for a significant number of designers inclusive design has emerged as its own distinct approach to inclusivity and accessibility. The Inclusive Design Research Centre at OCAD University has defined inclusive design as “design that considers the full range of human diversity with respect to ability, language, culture, gender, age and other forms of human difference.”²⁵ In their approach, the distinction between inclusive design and Universal Design rests in three realms: First, the context in which inclusive designers work is primarily digital. Second, they believe that Universal Design has become associated with disabilities primarily and “want to stress that the individual is multi-faceted and the constraints or design needs they have may arise from a number of factors or characteristics, and they all need to be taken into account.” And third, inclusive designers purport to create adaptable systems that mold to each person’s needs rather than a single solution that works well for many.²⁶ This final factor is what Kat Holmes describes as the distinction between a one-size-fits-all approach and a “one-size-fits-one” approach.²⁷ Though inclusive design can be seen as its own separate approach to design, it is often structured in relation to Universal Design. Many of the distinctions that designers make between these approaches have less to do with the intended principles of Universal Design than they do with the way that it has come to be seen in a narrow manner. Though Universal Design grew out of a desire for greater

inclusion of disabled individuals, and, in the minds of many, has become narrowly associated with disability, there is nothing in the concept itself that dictates this circumscribed view. Some designers may be drawn more to the term “inclusive design,” but fundamentally there is little difference between this and the originally intended broad view of Universal Design, which considers factors far beyond a user’s abilities in formulating designs with broad usability.

Taken together, these critiques of, and responses to, Universal Design suggest important potential limitations of the approach, and areas for particular caution. As with any set of principles, Universal Design is only successful when thoughtfully and carefully applied to specific situations. Moreover, Universal Design has always conceded that it is not a panacea, but simply a way of improving design so that it meets the needs of a wider audience. While these criticisms may not be enough to discredit Universal Design, they are helpful as guidelines for how the concept can continue to grow and develop. The insights offered by those who have questioned the efficacy of Universal Design can help guide those who want to apply its principles in ways that will lead to even greater inclusion across all fields of design. These concerns offer new directions for further development of the principles and practices of Universal Design in all settings and fields. Ultimately, the authors of “Multimodality in Motion: Disability and Kairotic Spaces” perhaps said it best when they said, “Universal design is a process, a means rather than an end.”²⁸ While implementing this process and principles, it is important not to lose sight of the larger end goal, which is inclusion of the widest number of people possible.

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Chapter Five

Applying Universal Design Concepts to Libraries

With a thorough understanding of the principles of Universal Design, it is possible to reconsider the design of all aspects of libraries. Many of the examples of Universal Design discussed in previous chapters can be found in libraries just as they can be found in other settings. But, at the same time, there are many ways that the principles of Universal Design can be applied to the unique circumstances of libraries in ways that will create more inclusive, usable, and accessible experiences for all users. This chapter highlights some of these specific applications of Universal Design in libraries and can serve as a starting point for those hoping to apply the principles at their library. While not an exhaustive list of the ways that Universal Design can improve the spaces, services, and resources offered by libraries, these examples are among the most commonly encountered opportunities for the application of the principles of Universal Design. Hopefully, this discussion can inspire the thought processes necessary to ensure that all design decisions in libraries are made in a way that fosters accessibility and inclusion.

ARCHITECTURAL FEATURES

In many cases, the barriers that users of library spaces face are a direct result of the core architecture of the building that houses the library. Most, if not all, library workers have encountered library spaces that not only fail to meet the requirements of Universal Design, but in many cases fail to meet even basic accessibility standards. Frequently, this is due to the age of the facilities. Many libraries are housed in old or even historic buildings that were created well before the passage of the Americans with Disabilities Act in 1990 in the United States or similar accessibility laws in other jurisdictions. These

buildings may have steps at their main entrance, narrow stacks for their collections, inaccessible restrooms, tiny elevators (if they have elevators at all), and built-in features such as public service desks and study carrels that are far from universally designed. Worst of all, changing such central features of a building can be difficult or impossible without major redesigns, which often involve a significant amount of time and money and may also require closing all or part of the facility during the course of the work. In the case of historic buildings, there may even be limitations on the changes that can be made to the space due to its historical significance.

Though modern library buildings in the US and many other countries across the world are subject to legal standards aimed at offering access to those with disabilities, these standards have not proven to be a cure for all problems. As discussed in the introduction, access issues can still find their way into newly designed and constructed library spaces. This may occur where new construction projects fall within certain narrow exceptions under laws such as the ADA,¹ but they can also occur due to unintentional oversights. In some cases, they may also be the result of designs that technically comply with legal requirements, but still fail to provide meaningful and equitable access for all users for other reasons. This is in part because Universal Design is still not an area of expertise for most architects. As Elaine Ostroff noted in 2011, there are “only a handful of universities around the world where universal design, or inclusive design, or design for all is even an elective within the professional curriculum.”² Moreover, while some architecture programs do offer training on Universal Design, which improves architects’ knowledge of the principles, some research suggests that frequently this does not meaningfully change architects’ attitudes to the topic.³ This is a particularly significant issue in cases where the exposure to Universal Design is limited to a single course. While this is a common approach in architecture and design courses, it has been demonstrated to have an insufficient impact on the students’ future practice.⁴ Practitioners face further barriers to implementing Universal Design as well, including a lack of understanding of how to evaluate and prioritize projects from a Universal Design perspective and limited interest from customers surrounding this topic.⁵ This lack of experience may not necessarily indicate a lack of interest in Universal Design and inclusion more broadly, but it does serve as a limit on the degree to which these principles will likely be applied in their designs, and may also suggest that they may not have experience broadly conceiving of the needs of a diverse community of users.

This means that those working on library projects with architects, therefore, cannot assume that the architects will have expertise and experience with applying the principles of Universal Design. Instead, Universal Design

experience must be a criteria for selecting the architect for the project. The following questions can be useful in evaluating architects' knowledge and interest in Universal Design as well as their commitment to applying it to a particular project:

1. What is your philosophy around inclusivity in design?
2. How do you put this philosophy into practice in your work? How do you balance that philosophy with your own personal design style?
3. Does the company have examples they can share of past designs that incorporate the principles of Universal Design?
4. Can any of the references you have offered speak to your skill and experience with Universal Design?
5. Do any of the individuals who will be working on the project have training in Universal Design or other inclusive design practices? Does the library's primary contact person on your team have experience with these topics?
6. Do you have external experts in Universal Design, accessibility, and inclusion whom you typically work with on these types of design projects? What will their role in this project be? Do you have examples you can share of past projects where you have partnered with them?
7. What challenges do you foresee in applying Universal Design principles to this specific project? How would you recommend addressing these challenges? Are there any challenges you think would be unresolvable?
8. How do you intend to assess and evaluate the needs of our community as part of your design process?
9. How would feedback that we or members of our community have on your proposals be integrated into the final design?
10. Do the contractors and/or construction team you work with have experience and expertise in applying the principles of Universal Design? [This question is for use in the case of projects where the architect will arrange for the contractor and/or construction team.]

Even if an architect with experience in this area is selected, it should not be assumed that they will incorporate Universal Design concepts without further advocacy from the library team. While these questions can help to emphasize the design team's commitment to Universal Design, the library team responsible for working on the project should be tasked with keeping these topics at the forefront of all work with the design team to ensure that it will not be overlooked. The project management or organization plan that is put in place should integrate check points for specifically reviewing not just that the project is meeting minimum accessibility requirements but also that the

principles of Universal Design have been addressed and the design responds to the principles and the actual needs of users.

In addition, the library team responsible for the project should have a clear plan for working with members of the community to gather feedback at all stages of the project. It is unlikely that the members of the library team will be experts in Universal Design themselves and, even if they are, as previously discussed, it is important to collect feedback and suggestions from a diverse group of actual end users, who will be best able to represent and communicate their needs. Sharing design proposals with community members for feedback before any plans are finalized is an important strategy for ensuring that the final design will truly be inclusive. While this is not a substitute for careful review by the library team nor for the initial expertise of the design team, it is a key method of catching any oversights or issues before they are literally set in stone. It is better to build this process into the early stages of design rather than having major regrets after the opening of the building, when changes will be difficult, expensive, or impossible.

Similarly, major construction projects frequently are not feasible due to budget issues or because they would limit access to the library for an extended period of time. In those cases, it is important to not immediately give up all hope of applying the principles of Universal Design. With creativity, there may be the ability to mitigate some of the issues or find other ways of being more inclusive. A few examples of this include the following:

- If the main entrance is inaccessible and a complete overhaul is not practical, consider whether it may be possible to add on a temporary fix, such as a removable yet structurally sound ramp so that the main entrance can be used by all.
- If the main entrance is inaccessible and cannot be made accessible, consider whether the accessible entrance that is currently the secondary entrance can instead be turned into the main entrance for the building.
- If none of the group study rooms allow for Universal Design, consider whether another room that offers more flexibility can be turned into a group study room.
- If the public service points use built-in furniture, consider if alternate, free-standing public service points can be added to offer greater flexibility and more options for equitable use.
- If some spaces of the library are not accessible to all and it isn't possible to perform the construction work necessary to fix this, consider whether these spaces can be redesigned so that they do not contain unique content. For example, could the inaccessible section be made into a secondary study space which is replicated in other, more accessible sections of the library?

When considering how to repurpose and redesign spaces to mitigate these sorts of issues, avoid making assumptions that certain types of users will not want to use specific types of spaces, services, or resources. Also, keep in mind that library employees are users of the library as well. It is all too common to forget the needs of employees when applying these principles to design projects, but in reality, they usually are the most consistent users of the library's spaces and their needs are likely as diverse as the needs of the community as a whole. An ideal application of the principles of Universal Design to library architecture would seek to make all spaces, services, and resources usable by all.

FIXTURES

Fixtures are items that are permanently installed or attached to the building. In libraries, this can mean a lot of different types of items. While one of the quintessential examples of fixtures are lighting fixtures, those will be discussed in the next section because lighting is so important in libraries. However, fixtures include many other items as well, such as the brackets and structure used to mount digital displays, installed fans, and even shelving units if they are permanently installed. In some cases, installing fixtures is necessary and appropriate; however, it is worth mentioning that the focus on flexibility at the core of the principles of Universal Design points to the advantages of choosing alternatives to fixtures where possible. Modular and movable items can be rearranged for special events, changing usage patterns, and accessibility needs. Creative solutions such as shelves on wheels, moveable white boards (which can also serve to delineate flexible spaces), displays on carts, and other flexible versions of common fixtures are good alternatives when redesigning spaces.

When installed fixtures are a necessity, it is important to design them to minimize the issues that they can present. In all cases, they should be installed in ways that allow for both flexibility in their use and adequate surrounding space for access and approach. Many institutions look to the standards of the local accessibility laws to determine the space needed. However, it is important to consider whether alternate uses may require more space than the legal minimum. It is important that patrons who use wheelchairs not only be able to move through an aisle or between pieces of equipment, but that they are able to turn and navigate freely while in the space and reach objects comfortably. Moreover, the focus should not be solely on wheelchair users, but also those using walkers and other mobility aids, pushing strollers, or, in the case of employees, maneuvering a full book cart. As ever, the important part of

determining where and how fixtures should be installed is to think broadly about both the needs of potential users and how spaces themselves may be repurposed and redesigned over time.

LIGHTING

Though often considered a fixture, there are enough special issues regarding lighting that it bears separate consideration from a Universal Design point of view. Wherever possible, the library should offer flexible lighting solutions throughout both public and employee spaces. There are multiple ways to achieve this. In many situations, lights that include a dimmer feature are particularly helpful. They allow the library, or potentially even the individual user, to change the precise lighting level of a space based on everything from personal preference to activity to time of day. As such, they offer maximum flexibility, particularly when it comes to built-in lighting solutions meant to serve an entire room or other large space. Libraries that have dimmer lighting available often use them to offer programming for those with specialized sensory needs or for young patrons who may benefit from different lighting levels.⁶ This type of specialized lighting can be more difficult to re-create in settings where this type of precise and uniform control of the light is impossible.

As an alternative, it is also possible to have various spaces around the library that offer different lighting options with some low-light areas and others offering brighter light or even natural light. This can have some limitations, however, particularly in cases where a person may need a particular mix of lighting or where other features, such as furniture, make flexible lighting arrangements impossible in the library as configured. Nonetheless, having a variety of lighting options offers users the ability to select the lighting configuration that works best for them. It also avoids a situation where a person is unable to work in the library at all because a single type of light, such as fluorescent light, is used throughout the space. When selecting lighting solutions for different sections of the library, one should not forget employee spaces and their specialized lighting needs.

Some libraries⁷ offer lamps as part of their circulating equipment collection, which offers a creative and flexible way to address the limitations discussed above. An added advantage of this option is that it also allows patrons to check out lights to address lighting needs outside the library as well, such as in dorm rooms on a campus or for special events. Libraries may even consider ways to meet more specialized lighting needs, such as offering blue lights, sunlamps, light therapy lamps, or similar lamps that mimic natural light in a manner that combats Seasonal Affective Disorder (SAD).

At some libraries, such as Oregon State University's Library⁸ or University of Maryland's Terrapin Learning Commons,⁹ these specialized lamps are available for checkout. At other libraries, such as University of Minnesota's Magrath Library,¹⁰ there are both lamps available for checkout and stations in the library for use of these specialized lamps. Offering lamps for checkout is a great approach to maximize the degree to which patrons can choose and customize how their lighting needs are met throughout the library and beyond.

FURNITURE

While structural architectural changes can be prohibitively expensive, in many cases changing furniture can significantly improve the design and accessibility of a library space without major costs. By its nature, furniture is also more likely to become worn, and therefore needs to be replaced more frequently than physical aspects of the building or the fixtures. This makes them an ideal target for evaluation through the lens of Universal Design principles since the library may have it in the budget to replace at least some of the furnishings regularly. When evaluating furniture, the most important principles to keep in mind are equitable use and flexibility in use, though other principles may be relevant in specific situations.

Though it may not always be possible to find furniture that is usable for all users equitably, an alternative approach to the equitable use principle is to strive to offer a mixture of different types of furnishings that meet varying needs. As an example, there are two approaches to offering work surfaces in a library. Option one would be to purchase adjustable desks and tables that users can manually set to their own preferred height. This offers maximum flexibility and can allow all users to use any of these tables. However, it may not be practical for reasons related to cost, size, or the need to limit user adjustment of the item, such as when the surface houses fragile technology. As with any technology, it will require educating users how to operate the mechanism for adjusting the table height and recognize that some users may not be able to operate the mechanism. An alternative approach is to offer a mix of types of desks and work surfaces at a variety of heights throughout the library so that users can select their own preferred setup even if it's not customizable. The optimal approach may well be a mix of both of these options, with the library offering both a variety of types of static work spaces and a limited number of adjustable work surfaces. This mixed approach can be particularly helpful because the adjustable tables and desks can be repurposed for a variety of needs that may be unanticipated at the time of their initial purchase, saving time and money in the process.

When considering furniture, it is also vital to pay attention to seating. Research demonstrates that patrons have significant preferences for specific types of seating in the library¹¹ and may alter their library use patterns based on availability.¹² In addition, studies suggest that patrons in at least some libraries, particularly academic libraries, appreciate the ability to move furniture into their preferred arrangements¹³ and may arrange furniture and other items to create a sense of privacy where possible.¹⁴ It is also important to remember that users may go beyond what the library considers their core user group. For example, research has indicated that furniture is important to parents using academic libraries while their children are with them,¹⁵ and that undergraduate students, particularly those in online or distance programs, may use public libraries for their studies. These are just two examples of groups that may be overlooked when enumerating a library's communities, and they help to illustrate the importance of thinking broadly when defining the community and their needs.

Beyond simple preference, it is also necessary to select seating that will fit a variety of different immutable needs. When doing this, it is important to think broadly about what these needs may be. The various seating options in the library should not just work for users of different heights, weights, and levels of mobility, but they should also consider the true breadth of the library's user base. Are the seating needs of users accompanied by children being served? What about patrons in the library with a service dog? Would someone who uses a mobility aid such as a walker or crutches be able to get to the seating in the library and stow their device(s) within reach? All of these questions and more should be considered when selecting and arranging seating in the library so that everyone has a place to sit and work comfortably within the library's walls.

SIGNAGE

When considering a library's signage, it is important to carefully consider how to make it inclusive. Because signs often rely on text, they can prove to be problematic for a host of different user groups including those with low literacy, those for whom the local language is a second language, those with visual impairments, and those who are distracted. Though the principle that is most often implicated in the design of signage is principle 4 on the importance of perceptible information, others can be relevant as well. When applying the principles to signage, the content of the sign is not the only factor that should be considered.

Placement of signs is one of the key factors in the design and use of signage, and can have a significant impact on the approach for an effective sign. For



Figure 5.1. Example of a sign from the University of York Library that includes text, color coding, and icons to assist patrons in understanding the sign. Photo courtesy of The University of York Library.

example, height is an important starting place in designing a sign. Signs should be placed at heights that will make them usable by all. This is particularly important to remember for any signage that will incorporate Braille or other tactile elements, such as raised letters, for accessibility. These signs should be placed at a level that ensures users of various heights, including those who are sitting down while using a wheelchair, will be able to use the signs with ease. When signs must be placed at a high vantage point, for example, signs hung from the ceiling, the size of the font and any included icons should be increased. One should recall that placement of signs is an area that may be subject to extensive regulations, particularly with respect to required safety signs. An ideal design will strive to meet all legal requirements but go beyond them to consider the end users and address their broader set of needs.

In addition to height and vantage point, all signage should be carefully designed to work well with the available lighting. Where possible, adjustable lights should be moved to highlight signage. In cases where it is not possible, signs should be placed in a manner that works best with immovable light fixtures. Signage should generally use matte surfaces if the surrounding lights may lead to glare. While this can be a significant change for some libraries where lamination of signs is popular, it is important to ensure accessibility for those with low vision.

Another common issue in signs is their use of color. Signs often use color as a way to convey additional information, such as using red for stop. It is important to ensure that when color is used in this way it is supplemented with other means of conveying the information so that the sign is accessible to those who have trouble perceiving colors. This can be done through text and/or shape. For example, stop signs, which are traditionally red, also have text with the word STOP on them and are generally octagonal. This trio of features works well to help viewers quickly understand the sign even if they cannot discern the color or are unable to read the text. One should recall, however, that these types of iconic features can vary by country, which is another reason it is important to convey the information through multiple means. When designing library signage, one should seek to include similar levels of redundancy to provide information in a way that supports all viewers.

When color is used in a design, it must also be used in a way that will be accessible and user-friendly. The most important aspect of this process is ensuring sufficient contrast between the colors. Contrast is important because a percentage of library users is likely to have color vision deficiency, also known as color-blindness, which impacts a small but significant portion of the population worldwide.¹⁶ Moreover, even among those who are not color-blind, some may struggle to distinguish between colors in low light,¹⁷ particularly those who are aging.¹⁸ For all of these reasons, color contrast is

an important part of making designs widely perceptible. Ideally, the color contrast of all items should exceed the minimal values set forth by accessibility standards and should also be modified in response to the placement and lighting of the sign in its final location or locations.

Signs should also include multiple representations of the information being conveyed. If the sign includes text, consider how the same information can also be conveyed with icons, pictures, or, where these options are not possible, raised letters or Braille. Iconography can be particularly helpful because it is simple and therefore memorable and easy to quickly understand. Developing a consistent use of iconography throughout the library can make the speed with which users understand the message even faster, which is particularly helpful for those who are moving quickly through the space or who are distracted.

While signage is an important feature in virtually all libraries, the principles of Universal Design also point to the importance of minimizing the number and kinds of signs in a single space. With too many signs, the space will quickly become cluttered and confusing for those who are distracted or have cognitive impairments. Research has suggested that repetitive and even out-of-date signs are common in libraries and limit the effectiveness of the overall signage.¹⁹ In fact, conflicting signage is worse than no signage at all, as it will lead to confusion and frustration. Libraries are better served by consistent and clear signs that focus on the most pertinent information.²⁰ Overall, the focus on signage design should be to consider it through the lens of the principles of Universal Design and conduct user testing on the content and design elements with a diverse group of users.

SERVICES AND PROGRAMMING

Though Universal Design is often associated with architectural design and product design because of its history of emerging from these fields, it is also applicable to service design. As libraries debut new services and programs, it is vital that they adhere to the principles of Universal Design. These principles can offer guidance not only for designing the spaces or selecting the tools for these new services and programs, but also for providing a road map to successful outreach for these programs and considering how library staff will interact with patrons as part of these new offerings. This work represents the intersection between Universal Design and Universal Design for Learning (UDL), a framework discussed in greater depth in later sections of this book. As new services and programs are conceived of and designed, the principles of both Universal Design and UDL should be at the forefront of the process.

As an example, in the past several years, many libraries have developed maker programs and services either with dedicated space allocated for this work or through programming series on the topic. Unfortunately, in many cases, this work was not done with a clear focus on creating inclusive offerings for all. This has led to issues of participant homogeneity and a lack of inclusivity and accessibility at more than one library.²¹

To address this, the principles of Universal Design and UDL can be brought to bear on this area of library work. Through the lens of Universal Design, one can appreciate that creating a space that is welcoming to all means creating a space with tools and equipment that offer flexibility and equity in use while being tolerant of errors and require low physical effort. It also includes creating instructional content for the use of the space and equipment that is easily perceptible, potentially through a mix of video and written instructions. Finally, this process requires integrating feedback solicited from a variety of users including both those who have participated in related programming and services in the past and those who have been underserved in the past. The planning for this space should also carefully consider the types of furniture and layout chosen to make it as inclusive and welcoming for all potential users. Ultimately, shaping this new service and program through the lens of Universal Design completely changes the direction in which the library approaches the project, leading to a more inclusive and accessible experience for all users. At many institutions, this would represent a fundamental shift in the design of new services and programs, allowing them to move from a mindset of merely retrofitting existing services and programs to accommodate the specialized needs of specific users upon request, to one of integrating inclusivity from day one.

Libraries have much to gain by adopting a clear commitment to Universal Design at all levels of the organization. Not all institutions will be able to make radical changes overnight. But by meaningfully integrating these principles and feedback from impacted individuals into all projects, libraries have the potential to completely change who is seen as a core member of the library community and who feels welcome in library spaces and programs. The impact of this work can significantly improve the way that the library is viewed by previously underserved segments of the community.

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Chapter Six

Universal Design Case Studies

As demonstrated in the previous chapter, Universal Design encompasses many different types of work that impact a variety of library settings and designs. This is why the principles of Universal Design can be so effectively applied in a multitude of ways whether at public, academic, corporate, school, or other kinds of libraries. This adaptability emerges naturally from the way that the principles of Universal Design seek to address the full range of user needs and from the variety of projects that involve design work. The versatility of the principles has led many libraries to apply them successfully at their institutions. From grand architectural design projects to narrowly focused reimaginings of services, libraries have found that Universal Design can improve user experience, foster inclusion, and, at the same time, ensure that their offerings are broadly accessible for members of their community. The results are indisputable, bringing new segments of the community to the library in ways that were not possible prior to undertaking this work. The possibilities are truly limited only by the scope of the project and the imagination of the team tasked with realizing it.

Nevertheless, the wide scope of Universal Design can be both a promise and a curse for the implementation of Universal Design. Because it can be applied in so many different ways and incorporates so many different ideas, it can be difficult for teams to feel confident getting started with this work at their institution. These challenges are not a reason to wait to apply the principles. The following case studies demonstrate that there are many ways for libraries to start adopting Universal Design in their institutions in ways that foster both big and small changes. These case studies offer inspiration for others interested in finding ways to apply these principles at their libraries and can also help to demonstrate the value of this work to teams who remain on the fence. Ultimately, the goal is that these examples will not be exactly

replicable at other libraries, but instead serve as a proof of concept for the advantages of Universal Design.

THE MAKERSPACE AT TEMPLE UNIVERSITY LIBRARIES¹

The libraries at Temple University in Philadelphia, Pennsylvania, offer a full range of services to support cutting-edge research and instruction across the disciplines taught at the University. An important space within the libraries is the Loretta C. Duckworth Scholars Studio, which supports a wide range of types of research, practice, and innovation, including digital humanities research, digital arts, gaming, big data, and making. Within this studio, the makerspace is an area that features technology, equipment, and expert support for collaboration, critical making, and experimentation. They offer support for a range of types of projects such as sewing, 3D printing, laser cutting, and tinkering.² As with the rest of the libraries, this space serves students, staff, and faculty at the university, but their users also extend beyond this to all Temple University affiliates. Temple is situated in North Philadelphia and, as such, the libraries and the makerspace not only serve the campus community, but also the local community. This function is at the core of the libraries' operating principles, which include the statement that "[t]he libraries' press recognize their role in providing a welcoming environment for community members in North Philadelphia and the greater Philadelphia region, including access to technology, lifelong learning & life skills development, and cultural programming."³ This broad community means that the makerspace serves users who are interested in a wide range of projects and have varying levels of experience with the available equipment. As with all communities, the users also have a diverse set of needs and preferences.

To best serve their users, they must be prepared for all of these different goals, approaches, and needs. Under the guidance of Jasmine Clark, the Digital Scholarship Librarian, the makerspace team has applied Universal Design to both the physical design of the space and the services that are offered to create an inclusive environment and ensure that they are ready and able to serve all users. The makerspace is based in a space within the libraries that was newly built. As is so often the case in libraries, however, the team was not able to design the area to their own specifications or even to have the input necessary to ensure that the space was accessible to all users. This necessitated starting with an in-depth audit of not only the space but all of the materials within the space with an eye toward ensuring that they were universally designed. Clark undertook this process early in her work in the makerspace and carefully documented areas in need of remediation, particu-

larly those that failed to meet minimum accessibility requirements. For example, upon finding that one of the doors in the area was not wide enough to accommodate patrons who use wheelchairs, the issue was able to be reported so that the door was widened to the proper specifications. This is an important demonstration of the fact that it should never be assumed that spaces meet the requirements to be accessible to and usable for all users. An audit of this kind can be a relatively straightforward way of identifying issues before a patron encounters a barrier and offers the ability to prioritize making the necessary changes early in the use of the new space.



Figure 6.1. The Loretta C. Duckworth Scholars Studio's Makerspace at the Temple University Libraries.

Photo courtesy of Jasmine Clark and Temple University Libraries.

Beyond the physical features of the space, this audit also found that the fixtures within the space could present other types of barriers. The counters with seating were at a height that required users to climb up onto them, which was an important issue to note so that alternatives could be provided for those who might not be able to climb up to use a seat. In addition, signage was inconsistent, both in terms of the height it was placed at and the use of tactile elements, making it inaccessible to many users with disabilities. The audit process was a relatively low-impact activity that ensured the staff members at the makerspace were aware of any issues with the facility and allowed them to start the process of remediating these issues before receiving a complaint and before a visitor encountered these problems and felt that the makerspace was not meant for them.

Though physical spaces and the related fixtures and furniture are often the first areas that come to mind when thinking about Universal Design, a thorough application of the principles can go far beyond this. In particular, services, and the way that they are structured and offered, can be overlooked when too much focus is concentrated on spaces. Clark was clear from the beginning that a central part of this process had to be ensuring that services were offered in a way that was inclusive and welcoming for all users. To achieve this goal, she focused on training. Staff at all levels, including student workers, were offered training that included everything from basic disability etiquette and cultural competency training to tailored problem-solving skills with a focus on inclusion. Developing the training presented its own challenges, as Clark noted that she had “been solely thinking about disability and inclusion in our spaces for three years now and trying to condense that down for a new person can be challenging.” To be successful, the training needed to be calibrated to the appropriate level for staff with limited experience with the topics, while still providing adequate guidance for the types of situations that staff would encounter in the makerspace, to offer a structure of high-quality service. At the same time, it needed to make the process approachable so that participants never felt overwhelmed and understood how they could integrate the information into their day-to-day work. This was particularly instrumental in making the content meaningful for all employees regardless of their job description or their past experience with inclusive services and the principles of Universal Design.

A focus on preparing staff to provide inclusive services can make all the difference for the actual experience of users as well. To be successful, the training program needed to build awareness among the staff of potential issues that users might face and how the staff could appropriately assist them. Clark found that the training “gave workers the tools needed to improvise in a creative and informed way. . . . [They] felt prepared when a curve ball came in.” The staff was prepared to help patrons even “when a patron came in and [the situation] wasn’t something that we covered in a specific training.” This level of comfort is difficult to achieve, but it is imperative to ensuring that services are universally designed. Training focused on creating this culture and level of comfort allows the staff to move beyond a list of preexisting accommodations to universally designed services that are ready to be adapted to the actual needs of real users. Best of all, this move also transitions from a focus on asking the type of disability or accommodation the user needs to being prepared to offer high-quality services without these sorts of invasive questions and without the need for patrons to follow a specific set of steps to be eligible for accommodations.

The training gave staff the tools they needed to both recognize issues before they were barriers to users and to respond to requests from individual

users on the spot as needed. In both cases, it has already been proven to be successful. Though the initial audit of the space addressed many of the existing barriers, staff have already used the skills they have learned to develop new improvements. For example, after the training process, the makerspace manager began experimenting with printing Braille on dice as the first step toward designing and producing Braille signs for the storage that is currently labeled with non-tactile signs. This step toward ongoing iterative improvement of the space ensures that inclusion is at the core of the makerspace's guiding principles and that it will only get better with time. It also demonstrates how investing the time in training staff to understand inclusion and Universal Design can allow them to apply their own creativity and initiative to these efforts. In this case, a staff member was able to use their particular expertise and experiment in a way that might not have been considered by other members of the team. By giving everyone the tools to understand the principles of Universal Design and how to build an inclusive service, this training has expanded the role staff at all levels are able to take in this process and has opened the door to ongoing innovation.

After the training, the staff was prepared to provide seamless services to users with disabilities. Throughout the training, the focus was not on disabilities or individual needs, but instead on what barriers might exist and how they could be addressed for all users. This helped staff to think about the makerspace's tools and offerings in new ways, which, in turn, left them ready to help patrons. Discussions of the barriers presented by touch screens or technology that uses sounds as alerts left the staff primed to understand how they might help patrons for whom barriers did exist. In practice, this has already been tested and found to be successful. Patron satisfaction has improved while staff frustration at not knowing how to best offer these services has decreased. When disabled patrons have used the facility, staff have solutions ready to go immediately. Clark mentioned that when their first visibly disabled patron visited, the graduate student working at the time was so well prepared to offer equitable service to this patron that they did so and forgot to even mention it for over a week because it felt like such a natural part of their work.

This level of service has allowed the makerspace to develop a reputation for excellent service for users with disabilities. This, in turn, has also helped to build an even larger user base as community members with disabilities learn about the space and the services it offers through word of mouth. As ever, positive word of mouth has proven to be a particularly effective way of enticing new visitors to the space. It has even led to partnerships with other local library services focused on assistive technology. Overall, this approach to designing inclusive services has been a huge success for the makerspace.

Another way in which the program was a success is that it ultimately led to a broader appreciation for these topics across the libraries. Clark was able to expand the training about disability etiquette and accessibility topics to other spaces in the libraries, working toward a goal of an overall culture change toward greater inclusion. The staff members across the libraries have shown similar levels of enthusiasm and creativity in applying what they have learned. As just one example of the impact this training has had, the person in charge of creating the library's newsletter identified the fact that it had accessibility issues and has adapted their workflows to now incorporate consistent auditing of the newsletter to address these issues before they become a barrier for patrons. More than that, staff are starting to say, "Have we thought about accessibility? Have we thought about inclusive design?" at the start of projects as it is so important in the successful application of these principles. Clark has seen "a true culture change start" in a way that simply is not possible without staff buy-in and support. The library staff have embraced a new way of thinking about inclusion such that exclusionary design is no longer normalized. The success of this work demonstrates how much of an impact is possible simply by helping people to realize the barriers that exist and giving them the tools to be vigilant against these barriers in their future work. While the standard institutional challenges of red tape and limited resources are still present, the team at the library now has a new mindset and a new tool set that allows them to overcome these challenges and design inclusion into all of their work from the start.

THE UNIVERSAL ACCESS WORKSTATION AT COASTAL CAROLINA UNIVERSITY⁴

The Kimbel Library & Bryan Information Commons serve the entire campus community at Coastal Carolina University, a public university in Conway, South Carolina. With this central role on campus, they serve a diverse set of patrons, including over 10,000 students.⁵ To best serve these students, their spaces and facilities must be responsive to the wide range of needs represented in this population. Brady Cross, at that time an Access Services Specialist at Kimbel Library and now the Digital Initiatives Librarian at Tri-County Technical College, saw the possibilities offered by applying the principles of Universal Design to make the library more inclusive. He saw the opportunity to create a more accessible and usable experience for the many users who come to the library to use technology to complete their academic work. The idea grew out of a class assignment that Cross completed while pursuing his library degree and his own interest in Universal Design. This

personal interest is due in part to his own moderate hearing loss and in part to his background in commercial construction where he had seen the impact design could have on access.

Ultimately, this concept grew into the Universal Access Workstation (UAW), which applies the principles of Universal Design to one of the more ubiquitous aspects of the modern academic library: the computer workstation. According to Cross, Universal Design “is the central focus of this project, from idea to implementation. It begins with a need for equity in information access. The components are intuitive and flexible in use, the learning curve for the [Assistive Technology] is low, and the UAW blends in with the surroundings.” Because the project is intended to be inclusive, it incorporates carefully selected software, including assistive technologies. These technologies simultaneously allow users to accomplish common tasks, such as reading course materials or writing up assignments, and support those who may need to first adapt their course materials for use, such as through the incorporation of a document reader that converts text into machine-readable formats. The UAW also makes use of the built-in accessibility features in common software programs, which are often not enabled on public workstations. Through this combination of technological features, it has the necessary flexibility to support users with varying needs, whether due to personal preference, short-term injury, or ongoing disability.

Beyond software, the selected computer hardware also supported the design goals of the project. All components were selected to maximize access from the terminal, which was a single unit with an integrated large-screen

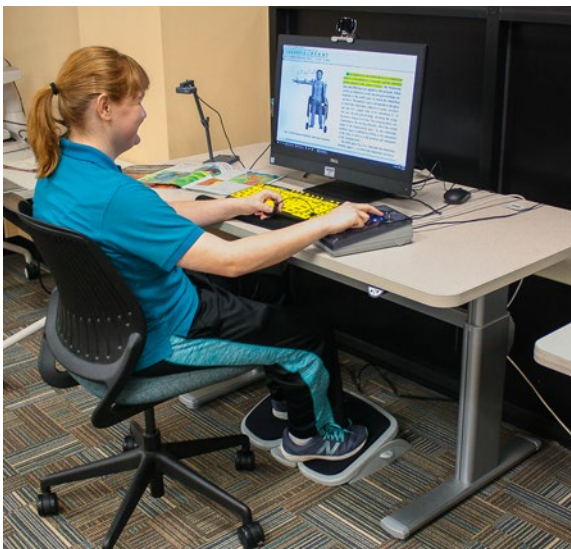


Figure 6.2. User sitting at the Universal Access Workstation.

Photo courtesy of Brady Cross.

monitor, to the peripherals, which included a high-visibility keyboard. The careful selection of these elements is instructive of the impact that each peripheral can have. For example, the mouse selected was specifically a universally designed one. Cross noted that “[t]he adaptive trackball mouse can be used by persons without hands or fingers, and/or can be modified for users with tremors. This mouse has inputs for switches (large buttons) for left and right click which can be placed anywhere and used by a variety of methods.” For users who cannot use the more prevalent tools, such as keyboards and mice, the workstation also features specialized adaptive tools that offer alternative input mechanisms, such as a switch. The UAW also features a microphone for users who utilize voice-input technologies and noise-canceling headphones for users who need to hear a screen reader or similar technology or those who find that a distraction-free environment helps their productivity. To be effective, each element of the workstation was analyzed in this manner and selected for its versatility and usability across many different users, which is the heart of the principles of Universal Design.

The setup was completed with furniture and ergonomic features that support flexible and configurable uses by a variety of users. Instead of merely conforming with minimal ADA requirements for computer workstations, the UAW is focused on integrating features that would meet all seven of the principles of Universal Design. Central to this is the desk itself. Unlike most library workstations, which are built around fixed desks or tables, the UAW makes use of a push-button adjustable-height worktable with a large surface. These choices are all carefully made. The adjustable surface means that users can customize the height to their own needs no matter their height, their desire to work sitting or standing, or their use of assistive technologies such as a wheelchair. The fact that this adjustment can be made with the push of a button fits closely with the Universal Design principle of requiring low physical effort so that a wider range of users will be able to set the surface to their desired height independently. The size of the surface also facilitates arranging the various pieces of technology as well as any other personal materials, such as books or papers, in the most usable manner for each individual. While many specialized work spaces isolate users with disabilities away from other library patrons, the surface size is also large enough to allow for collaboration among users.

In addition to the desk, the workstation also takes into account the importance of comfortable and adaptable seating, especially at a workstation that might be used for long periods of time. The chair was selected to be ergonomic for a wide range of users with features that can be adjusted by each user to meet their personal needs. This is supplemented by a footrest and wrist supports that ensure that each person can find a comfortable configuration

Table 6.1. The UAW at a Glance

<i>Software</i>	<i>Hardware and Furniture</i>
<ul style="list-style-type: none"> • Windows 10 OS • Screen readers • Voice capture • Document reader (converts text to OCR) • Document magnifiers • Adaptive internet browser extensions • Hands-free input device software • Accessibility functions enabled in operating system 	<ul style="list-style-type: none"> • Large screen monitor, all-in-one terminal • Document camera • Noise-canceling microphone and headphones • High-visibility keyboard and mouse • Hands-free input system (pointing device replaces mouse) • Adaptive trackball mouse • Switch • Ergonomic chair • Footrest • Wrist rest • Push-button adjustable height worktable

and the necessary support while using the UAW. These features can also be moved aside when users opt to use the workstation as a standing desk or if the patron uses a wheelchair.

Taken together, these separate components of the workstation demonstrate how many features must be optimized for inclusion. By applying the principles to each of these areas of the workstation’s design, Cross was able to create a space that seamlessly supports many different needs. This was a very intentional process that required research and careful comparison. Moreover, the design is not seen as an endpoint, but rather as a starting point. As Cross notes, “All components are flexible and can be changed out as needed to best reflect the current available technology.” This will keep the UAW from becoming dated and cut the cost of adding new features or replacing worn-out elements in the future. The aesthetic design of the UAW was also an important consideration. Cross notes that “the UAW is designed to blend in with the surroundings as opposed to being a ‘special’ workstation.” This helps to ensure that all users feel comfortable using the workstation, even if they do not consider themselves to be disabled, and also avoids any stigma associated with it.

Though making the UAW available to patrons was the central goal of the project, making it a success required going beyond simply setting up the equipment. It was important to set out the policies and procedures that would govern the use of the UAW. These included how to handle reservations and prioritization for users with disabilities.⁶ They helped to set the ground rules for ensuring that this workstation was inclusive while still offering access to those users who would not be able to use the library’s other workstations. As with any service or technology project, training proved equally important.

Cross has noted that he “led training workshops after the workstation was assembled and the response from library staff was enthusiastic.”⁷⁷ In addition to building buy-in among the library staff, this also ensured that staff could support patrons who had questions or encountered technical difficulties while using the workstation. At the same time, it could ensure that staff would know how and when to direct patrons to the UAW if they would benefit from any of its features. Creating policies, procedures, and training programs is a too often-overlooked element of making this type of redesign project a true success, but in this case it was a carefully considered part of the project.

Launching the UAW was not without challenges. Designing the UAW station did cost more than an average workstation, which made it important to have a clear budget as well as a justification for the project and a plan for future funding for necessary updates and upgrades.⁸ Cross found that at his institution, “the university was actively searching for ways to improve upon accessibility, so some of the funding was located immediately.” However, the modular and adaptable design of the UAW is such that other institutions could mitigate the financial burden by slowly accumulating the software, hardware, and accessories over time as the budget allows. It can be difficult to put an exact financial impact on improved access, but at many institutions this type of service improvement can help to justify a long-term commitment to the project and convince administrators to continue to provide funding for it over time.

The library also noticed that “some of the smaller items that make up the UAW could easily be mixed in with personal belongings (such as the noise-canceling headphones), therefore making the smaller items available for checkout at the circulation desk can help ensure they remain available for all users.”⁹ As experience with the UAW developed, it was possible to refine services to address minor issues like this one, but this does demonstrate the importance of postlaunch evaluation of any project so that iterative improvements can be made as needed.

The UAW has not only successfully expanded access to a wider range of patrons, but also given the library a reputation across the campus and beyond for being a leader in inclusive services. Cross found that “[t]he Kimbel Library is perceived as a leader in UD and UDL in part as a result of this project implementation.” The UAW is popular with other departments on campus and has been incorporated into their outreach efforts: “Accessibility and Disability Services has made the UAW a standard part of their campus tour. The Coastal Office of Online Learning promotes the UAW as a featured tool for those who need access to [Assistive Technology] when visiting campus.” It was also a factor in the library being invited to have a representative on the campus-wide Access Council that is working to improve the accessibility of

the institution's web presence.¹⁰ The project has also attracted the attention of other libraries. The project was highlighted as an example of being a change agent for accessibility,¹¹ and libraries have reached out to Cross for advice on how to create similar workstations at their institutions. The positive attention the project has garnered ensures that it will have a significant impact on campus and will encourage the application of the principles of Universal Design at other institutions as well.

PLEASANT HILL LIBRARY IN DAKOTA COUNTY, MINNESOTA¹²

Major construction projects can offer a great opportunity to make real changes at any library and offer a particularly good occasion to apply the principles of Universal Design to eliminate barriers and create an inclusive environment. At the Pleasant Hill Library in Hastings, Minnesota, a recent renovation and expansion project offered Dakota County Library an opportunity to reconsider the entire library through the lens of Universal Design to create a library that better served their patrons. From the start, this was an ambitious undertaking, with Dakota County ultimately selecting the most expensive but also most transformative of three possible approaches to the project, in part because they knew the local community had a need for free and accessible meeting spaces. This allowed the library team, under the guidance of Margaret Stone, Director of the Dakota County Library, to completely overhaul the library to offer almost 1,500 square feet of additional space,¹³ including expanded programming and community spaces, a remodeled children's area with a baby garden, new outdoor space with a patio, and expanded access through additional parking. Over the course of the project, they were able to add new spaces specifically designed for inclusion, contemplate how they could make everyone who visited comfortable in the library, ensure that the new space would be welcoming for Hastings's aging population, and achieve many of the inclusion goals that they have been working toward for the past several years. The project gave them an opportunity to serve patrons in new and meaningful ways that responded to feedback they had collected and broadened the type of programming they were able to offer at the location. It resulted in a new space that was truly for all members of their community.

One of the reasons that this project was successful in achieving its goals of inclusion was because of its scope. While small-scale projects that apply Universal Design to various aspects of library design can have meaningful impacts, because this project was a complete renovation, there were broader opportunities. As Renee Grassi, Youth Services Manager at Dakota County



Figure 6.3. Children’s Area in Pleasant Hill Library.

Photo courtesy of Morgan Sheff Photography.

Library, describes it, “The architects were scoped to remodel the whole library, including exterior spaces.” Beyond this, the project was also intended as an expansion of the branch, which offered an opportunity to move beyond the existing footprint. This offered an excellent opportunity for a wide-ranging reconsideration about how the spaces could best serve users no matter their needs, while also ensuring that the facility had the flexibility to respond to changing needs in the future. The project offered the maximum amount of latitude for reimagining what should be included and how it should be designed.

Though the library team knew that inclusion was important from the start of the project, the architects and designers were not expressly chosen for their expertise with Universal Design. The project went through the standard Request for Proposal (RFP) process used in Dakota County, which did not have an evaluation based on Universal Design integrated into it. Fortunately, the firm with the successful bid, Kodet Architectural Group, Ltd., was both familiar with accessibility concepts and very open to input from the whole library team, particularly about Universal Design. This allowed them to explicitly consider how the principles of Universal Design could inform the project throughout their work. Teri Nagel, Principal of Kodet, pointed out that the firm often works on public spaces and focuses on Universal Design

throughout those projects. Nagel felt this was even more important in a library setting, noting, “Everybody uses the library from little kids to seniors and by applying universal design we make it accessible for everybody. . . . It is one of the few public buildings where people are going to go in and use it . . . you don’t go to city hall every day but some people do go to the library every day.” The firm has since highlighted the Universal Design elements of the project in a video and on their website. Overall, the partnership proved successful not only because of the selection of the designers, but because the architectural team was open to collaborating on their design. Both Stone and Grassi emphasized how much the architects and designers were able to offer to the project and how collaborative they were throughout the process.

Another key aspect of the success of this project was that the library team working on the project had a strong commitment to inclusion and included expertise in Universal Design and its application to renovation and construction projects. Stone said, “To me, Universal Design is just common sense. You don’t plan for the able bodied. You don’t plan for a person that fits this narrow definition of a library client or patron. It just makes it so much easier for people to use spaces.” In the case of this project, Grassi, in particular, brought experience not only with the principles of Universal Design, but also its application to library construction projects. This allowed her to work closely and effectively with the library team, county project manager, and architectural team to bring these topics to the forefront of the decision-making process, particularly in the children’s area. This was particularly effective because the team of architects from Kodet adopted a collaborative and open-minded approach to working with the subject-matter experts from the library team to create a design that was focused on how to best serve library patrons. Stone noted that the team from Kodet was particularly willing to work closely with the library team on the data that had been collected from the community. She said, “All of that data, we hashed it out in a series of meetings and tried to develop a series of priorities,” which helped them to determine that they needed a design that flowed intuitively and integrated flexibility. Grassi found that when Universal Design topics were brought up in meetings with the Kodet team, “they would build on the conversation. It was very clear they had not just a foundational understanding but a fairly strong understanding of accessibility” and they were interested in ideas about how to apply the principles of Universal Design to the project. Despite the general design knowledge brought by the architects, Grassi felt that the project was a success because both the architects and library team had expertise and experience with Universal Design.

As part of their commitment to inclusion, the Dakota County team has long worked to improve their services for disabled patrons and become more

inclusive. Because of their work in this area, the team was invited to apply for the Disability Services Innovations Grant from the Minnesota Department of Human Services. This grant is designed to foster greater innovation in the area of disability services. Dakota County Library was awarded a grant in 2018, in part to “[r]enovate libraries with sensory rooms and provide appropriate sensory equipment and materials to serve children with ASD [Autism Spectrum Disorder] and their families.”¹⁴ This offered them the funding to support their ambitious goal of introducing calming spaces in several of their branch libraries. While the Pleasant Hill Library renovation was already underway when this grant was awarded, it was early enough in the design process that it was still possible to integrate a calming space into the design. The space was intentionally designed to offer a quiet and neutral space for those who needed it. Not only was it soundproofed to block background noise and machine noise, but it was also designed with a neutral color palette, patron-controlled lighting, and the ability to move furniture in and out of the space to ensure that each patron could use the space in a way that best supported their needs. It allowed them to offer a space that could be used not only by autistic or neurodiverse patrons, but also by other patrons who were looking for sedate and quiet spaces in the library to manage their stress or otherwise calm down.

Moreover, the remainder of the grant was available for related initiatives that improved inclusion at the Pleasant Hill Library and other branches in the system. In particular, this meant that staff were able to have training that gave them the knowledge and tools to better and more inclusively serve patrons with disabilities in these new spaces. This ensured that the calming spaces and other universally designed features were able to be supported by a library team that was ready to make them a success. Though this may seem like an unrelated activity, training was vital to preparing the staff to both use and recommend these sorts of design elements and spaces appropriately. Without this training, these features can be overlooked in many situations where they would be beneficial and may not be widely adopted by patrons who may be unaware of their purpose and how they can be used.

With the design and training in place, these calming spaces have already started to prove to be popular and useful features of the new space, with both patrons and staff seeing benefits. In addition to being responsive to specific feedback that the library had collected before the renovation, the spaces are popular parts of the newly debuted design. The space has already been helpful in offering an alternative for patrons who may be stressed or upset. As an example, it was integral to a branch manager’s strategy for de-escalating a tense encounter with a patron within the first year of the branch reopening. Even beyond this, having this space available ensures that all patrons know

that they will have a space available to them if they find themselves overwhelmed while visiting the branch, which opens library usage to many who might otherwise feel uncomfortable in the space. They have also had a wider impact in the community, with the local high school looking to the library for inspiration and guidance as they start the process of adding their own calming space to their building.

Input from the community was a key part of the initial phases of this work. This took several different forms. Fortunately for Dakota County Library, they had already had an opportunity to take part in a county-wide survey in 2017 coordinated by Dakota County Social Services that allowed them to learn about the needs of autistic patrons. This collaboration started the library on a path to apply for a state grant of their own, and gave them an opportunity to “learn a lot about what barriers there were to using the library and how to make the library more inclusive.” This translated very directly into the design. For example, they realized the need for both training and the calming spaces because patrons raised concerns in the survey that staff may not understand how to support their needs, and parents of children with autism expressed interest in a space to use if their children need a low-stress environment. Being able to respond to the needs shared with them through this survey was an important advantage of the project.

Input from the wider community was also an integral piece of the work that the design team undertook. Before the project started, the library team already had feedback and information that had been collected as part of the recent strategic planning process the Dakota County Library Administration undertook. During that process, they had surveyed the community and ran small focus groups to understand the needs and interests of their patrons. As a result of this effort, they had recent, relevant data as they started the renovation. Stone also pointed out that as the renovation started, they distributed a survey on the project that had the dual goals of first notifying the community about the upcoming renovation and related library closure and second starting to collect their input on the project. To build on this survey data, they hosted community listening sessions with the library director and members of the architectural team so that local residents could offer feedback on the library and the proposed project. For several days in advance of these sessions, multiple different design options were posted in the library and local residents had an opportunity to review them and offer feedback. During the event, the room was stocked with Post-it Notes to encourage participants to write their thoughts on a note and post it next to the relevant design. The team encouraged everyone, even children, to participate in the process and tried to make it a fun experience while also gathering new information about community priorities.

Stone was also committed to encouraging input from the staff. She offered that she “feel[s] very strongly about collaboration in all the library services, not just remodels,” which made this a priority. To get active involvement from staff, they had meetings to collect information about their needs and recommendations for the renovation. They also built other avenues for feedback, including a survey and the option to comment on the project on an internal blog. All of this information from both the staff and the community contributed to the decision-making process and the ultimate design priorities and decisions.

This focus on Universal Design ultimately contributed to the success of the overall project. Grassi has found that the library “is probably one of the most intuitive spaces that I’ve been in. . . . It incorporates all of the principles really effectively, to the point where you don’t even notice the design. . . . It’s not obtrusive, it’s not in your face, it just works.” Even more importantly, the new design has been very popular with the community. Stone noted that there were some skeptics initially: “At first they were a little hesitant, because people get really attached to their library and they were really concerned it would take away the charm of the old building,” but the commitment to reflecting historic Hastings through design decisions helped to ensure the design’s popularity among residents. Some of these elements include historic images of Hastings that were integrated prominently into the design and a floor design that references the local riverways while providing intuitive guidance through the space, which, as Nagel noted, helped them to ground the space’s design in Hastings and its residents. Taken together with the way that the design responds to the needs the community has expressed in the past, it is little surprise that the redesign has been popular. Patrons love using the new spaces within the library and the new programming that is possible within the redesigned spaces, including the new iLab makerspace. It has proven to be particularly popular with local group-home residents with developmental and learning disabilities who have become regular visitors. Moreover, the flexibility that was integrated into the design as part of applying the principles of Universal Design has left the library ready to address future unexpected needs in new and creative ways, something that Grassi notes is particularly important now that they are reconsidering how to offer services during the COVID-19 pandemic. She has found that Universal Design “is more important than ever before, if that is even possible, during this pandemic” and having a library space that was designed with these principles in mind offers them more options in providing support and services to their community in a way that is safe and effective.

CONCLUSION

Universal Design offers a clear set of principles that can be brought to bear on a whole range of library projects, services, and programs. These case studies show just a few of the ways that it can help to ensure the effectiveness of major initiatives and can contribute to making the library more inclusive for all members of the community, no matter what type of community the library serves. Though these examples of Universal Design in action may not be reproducible at all libraries, they offer guidance on the key features of successful projects that adopt this approach to design. They demonstrate, in particular, some key features that are seen across projects, such as understanding and collaborating across the community, creating flexibility and options for choice, imagining a user base that is broad and inclusive, and ensuring that all work is backed up with necessary staff training and support. These case studies can serve as inspiration and advice for those who are interested in applying Universal Design to their own library projects, whether a redesign of a service or the construction of a completely new building. They demonstrate the impact and advantages of the considered application of Universal Design in libraries and touch on just a few of the ways that it can improve services for all library patrons.

NOTES

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12. Unless otherwise noted, information in this case study is based on interviews with Margaret Stone, Teri L. Nagel, & Renee Grassi. Stone, M. (October 30, 2020). Discussion with Carli Spina; Nagel, T. L. (November 6, 2020). Discussion with Carli Spina; Grassi, R. (October 18, 2020). Discussion with Carli Spina.
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Chapter Seven

A Checklist for Applying Universal Design in Libraries

These questions provide guidance to streamline the application of Universal Design principles in common library settings. Answering them can help evaluate projects to ensure that services, programs, spaces, and facilities are inclusive, welcoming, and universally designed. Not all of these questions are applicable to all projects. The checklist should be used as a starting place and a tool to be modified for the specific needs of individual projects.

SPACE DESIGN

- Is there accessible, designated parking for disabled patrons that is close to the entrance, labeled, and kept clear at all times (i.e., plowed, deiced, clear of garbage, etc.)?
- Are all outdoor areas adequately lit?
- Are the paths surrounding and leading up to the library smooth, gently sloped (or flat), and sufficiently wide for those with assistive devices, service animals, strollers, and/or equipment (such as book carts, delivery dollies, etc.)?
- Are the paths, ramps, stairs, plazas, and courtyards kept clear (i.e., of snow, ice, debris, etc.) to allow access for individuals with a variety of assistive devices, service animals, strollers, and/or equipment (such as book carts, delivery dollies, etc.)?
- Is the main entrance barrier-free (meaning there is a ramp or the entry is completely flat—even one small step will be enough to limit entry)?
- Are any entrances, paths, or other areas of the grounds that are not accessible clearly marked with signs that combine text and symbols?

- If the library is served by local public transportation or shuttles, is the path from that transportation to the library entrance clear and accessible?
- Are various seating options available to meet the needs of users of all sizes and with various physical needs and preferences? Are these various seating options scattered throughout different library zones and spaces (i.e., the children's area, study zone, etc.)?
- Are a variety of desks or adjustable desks available in different library zones and spaces?
- Are computer and technology stations in the library designed to offer flexible uses, feature intuitive instructions and signage, and have a tolerance for error?
- Does the library have designated areas for individuals who need quiet/privacy for sensory reasons, to use assistive devices, for lactation, or because of other unique needs?
- Are all types of spaces available and accessible to all patrons? For example, if conference rooms, makerspaces, children's play spaces, library stacks, etc. are offered, are they universally designed and accessible? If not, are there plans to accommodate the needs of those who cannot access the spaces?
- Are multiple types/levels of lighting available? Can patrons adjust the lights in any areas?
- Are computer stations with assistive technologies (i.e., screen readers, magnifiers, etc.) available and accessible to all patrons?
- Are all full and partial floors and levels accessible via ADA-compliant ramp or elevator?
- Are elevators large enough to comfortably accommodate those using an assistive device (i.e., wheelchair, motorized scooter, walker, crutches, etc.) and their companion(s)?
- Do all elevators offer multiple means of use, including auditory and visual signals as well as Braille or other tactile reading systems?
- Are any nonobvious steps or other changes in elevation clearly marked?
- Are doors wide enough to accommodate individuals using assistive devices?
- Do doors require low physical effort to open (i.e., automatic doors, lever door handles)?
- Are aisles and hallways sufficiently wide for use by individuals using assistive devices or other devices (i.e., book trucks, delivery carts, etc.)?
- Are aisles, lobbies, and similar spaces kept free of displays, tables, decorations, equipment, and other materials that obstruct access?
- Are bags, baskets, or carts available for patrons who may need assistance transporting materials? If not, is it clearly indicated that patrons may bring their own such equipment?
- Are all signs printed in high-contrast colors and large print?
- Are all signs in well-lit areas?

- Does the signage offer a combination of text and symbols?
- Is signage available in multiple languages?
- Is Braille signage and/or a tactile map available?
- Are call numbers and shelf identifiers written in high-contrast colors and large print?
- Is any specialized accessibility information (i.e., the location of accessible restrooms, any inaccessible spaces) clearly indicated on maps and signs?

EVENT & PROGRAM PLANNING

- Are event/program spaces universally designed (see earlier sections of the checklist)?
- Is the podium, lectern, or other space for the presenter (if any) adjustable?
- Is there a sound system to amplify the presentation or other provision to make the sound of the event accessible? Are all microphones adjustable to meet the needs of the presenter(s)?
- If there is a stage or platform, is there a ramp or other step-free way to access the stage?
- Are interpreters (including ASL and other languages) available? If interpreters are only available upon request, is this clearly indicated on promotional materials?
- For interactive events/programs, are there multiple ways for participants to participate, ask questions, and otherwise contribute (i.e., verbally, in writing, electronically, etc.)?
- Are there a variety of types of seating and standing options available?
- If food and drink will be provided, are there options for various dietary restrictions?
- Is all food and drink clearly labeled so that people with dietary restrictions and allergies can confidently eat and drink?

PROMOTIONAL MATERIALS

- Are promotional materials available in multiple formats (i.e., online, hard-copy, etc.)?
- Do the materials use clear and straightforward language with simple syntax?
- Are the materials distributed in a way that makes them widely accessible?
- Are the materials designed to be readable by all (i.e., high contrast, large text, etc.)?
- Do the materials convey the message through pictures and icons when possible?

- Are the materials available in multiple languages?
- Do the materials reflect the diversity of the community?
- Are videos captioned and audio described? Is there a standard workflow for this?
- Are transcripts provided for audio content created by the library?
- Do promotional materials for the event/program indicate that the event is inclusive (i.e., mentioning accessibility, food options, etc.) and offer contact information for questions?

WEB DESIGN

- Is accessibility and inclusive design a part of the web design workflow?
- Does accessibility testing take place on a regular basis?
- Does the library comply with a publicly posted set of web accessibility standards?
- Are usability tests run with a wide variety of patrons, including disabled patrons, elderly patrons, and patrons for whom English is not their first language?

COLLECTION DEVELOPMENT

- Does the collection feature a variety of formats (i.e., Braille, large print, audiobooks)?
- Does the catalog/discovery system allow patrons to refine/limit search results by format?
- Is accessibility a factor in collection development decisions, including for online content?
- Does the library collect materials in a variety of languages?
- Does the library systematically aim to collect diverse works by by creators representing a wide array of cultures, backgrounds, communities, and experiences?
- Does the library collect and make available a variety of assistive technologies (i.e., magnifiers, Braille keyboards, etc.)?

RECRUITMENT, HIRING, AND PROFESSIONAL DEVELOPMENT

- Are job descriptions written to be inclusive (i.e., eliminate nonessential physical requirements, include an inclusion statement, etc.)?

- Are job candidates asked about any special needs in advance of visiting the library (i.e., need to use the elevator during a tour, need for special food at any meals, etc.)?
- Are employees trained in how to interact with patrons appropriately and inclusively?
- Are the professional development opportunities offered to employees universally designed? (Also see chapter 13, “A Checklist for Applying Universal Design for Learning in Libraries,” for further information.)

There are several ways that this checklist can be used to improve the accessibility and inclusivity of a library. The most obvious way may be to simply work through the entire list when undertaking any major project. This method can have the advantage of becoming routine, and it can be a very approachable way to implement Universal Design principles for those who do not feel that they have expertise in the area. It is designed to ask clear questions that will prompt thought and can lead to relatively straightforward changes if issues are identified.

However, this checklist can also serve as a springboard for two more ambitious approaches to implementing Universal Design in libraries. The first is simply that it can serve as an example or template from which customized checklists are developed for each area of a specific library and for each significant project that the library undertakes. The advantage of this customization is that it ensures that the questions are being thoughtfully considered rather than simply applied without critical consideration. New questions could be added and existing questions refined to better address the precise situation for which the checklist is being used. The second approach is to use this checklist or a customized version of it as part of a regular process for reviewing accessibility, inclusivity, and the implementation of Universal Design principles at the library. Even when accessibility and inclusivity are priorities, they can easily slip by the wayside if not regularly reviewed and refreshed. Design features can break and be replaced with less well-designed alternatives, book displays can pop up in areas that obstruct access, furniture and equipment can be rearranged in ways that lead to clutter and limited maneuverability, particularly when technology is replaced over time. Setting up a regular cycle on which a checklist is compared to the current actual state of the library can help to identify these potential issues before they become too expensive or difficult to fix efficiently.

No matter which approach to this checklist a library selects, the practice of asking pointed questions in a structured manner that addresses various areas of the library and key functional areas can prove to be invaluable. This is true in libraries of all sizes and types. When it comes to design generally, and Universal Design specifically, careful planning and methodical evaluation are important to ensuring success.

Chapter Eight

Defining Universal Design for Learning

As the idea of Universal Design continued to expand in popularity in the architectural and industrial design fields, it began to spread to other arenas where practitioners were also interested in improving inclusion. One such field is that of education. As legal requirements and educational best practices have evolved, the number of disabled students being educated in the classroom with nondisabled students increased. This led many educators to reconsider the ways in which they designed education environments and curricular content to try to increase meaningful inclusion for all students. Moreover, as online education has expanded, these design challenges have grown to incorporate new technologies and techniques that were not possible just a few years before. All of these changes have left many educators interested in finding new ways to create educational content that can reach learners with a varied array of backgrounds, needs, and interests. These inclusion challenges and opportunities apply just as much to those developing educational content for use in libraries and beyond the classroom as they do for those who are developing course curricula.

At a time when educators of all kinds are looking to improve inclusion, it makes sense that the concept of designing educational content so that it meets the needs of the greatest possible range of learners would be a popular one. However, making Universal Design meaningful in an education setting is not as easy as simply applying the same principles utilized in other types of physical design. Instead, Universal Design for Learning is a framework that adapts these concepts and principles so as to make them meaningful in a broad range of educational settings and scenarios, from face-to-face K–12 classrooms to online tutorials. While many educators think of it primarily as a framework for designing educational content for classes, its principles are equally applicable to self-guided learning and informal educational programs

of the sort offered by libraries of all types. These techniques offer ways to make any educational content more inclusive and engaging for the widest number of possible types of users.

WHAT IS UNIVERSAL DESIGN FOR LEARNING?

Universal Design for Learning, which is frequently abbreviated as UDL, is an approach to designing learning environments and materials that seeks to make them accessible, meaningful, and beneficial to many different types of students. The framework was developed in the 1990s by David H. Rose, Anne Meyer, and a team of scientists and educators at the Center for Applied Special Technology (CAST), a nonprofit organization based outside Boston, devoted to education research and innovation focusing on UDL.¹ It was developed as a means of adapting the concepts of Universal Design to the creation of educational content. Through this framework, educators can understand how to prepare materials and approaches that are inclusive of a wide range of students with varied needs, whether they are from marginalized groups or not. As Bart Pisha and Peggy Coyne of CAST stated, “Like many other good ideas, UDL is startlingly simple: Think about the needs of the entire range of learners who are or could be in today’s classrooms, and then design curricula, materials, methods, and environments that support and challenge each learner as appropriately and consistently as possible.”² As with other applications of Universal Design, the goal is to develop inclusive experiences rather than requiring those with specialized needs to pursue separate educational opportunities. Each experience should ensure that all learners can succeed together rather than being forced to find alternatives that are accessible to those with disabilities and other specialized needs.

While this may sound intuitive, it can be strikingly complex when actually undertaking the task of designing educational materials. As with other types of Universal Design projects, it involves understanding the range of needs present among all members of the intended audience for the materials, as well as knowing how to respond to these needs in ways that offer an equitable experience for all. This focus on equity is a key to UDL. It is a framework that aims to offer equitable educational experiences for all learners rather than focusing on trying to ensure that all learners participate in the exact same experience. The flexibility and adaptability inherent in this approach are what allows for successful inclusion of all.

For this to happen, it is important for the work to have structure. The first step to that structure is a more clear definition of the concept. CAST offers one by stating that UDL serves as

a framework to guide the design of learning environments that are accessible and challenging for all. Ultimately, the goal of UDL is to support learners to become “expert learners” who are, each in their own way, purposeful and motivated, resourceful and knowledgeable, and strategic and goal driven. UDL aims to change the design of the environment rather than to change the learner. When environments are intentionally designed to reduce barriers, all learners can engage in rigorous, meaningful learning.³

The focus of UDL is on the removal of barriers that can be found in educational materials that are not designed with intention and a focus on inclusion. This mirrors the focus on barrier removal for spaces, buildings, services, and products that is central to Universal Design. However, in educational settings, this focus often means integrating a greater level of flexibility, choice, and adaptability into the end product so that it can meet the needs of a wide range of types of learners, an approach that may not always work in Universal Design projects related to physical spaces or items.

HOW IS UDL RELATED TO UNIVERSAL DESIGN?

Though at times UDL can seem quite separate from Universal Design, it is a natural outgrowth of the work that Ronald Mace and his colleagues have done in the architectural and industrial design fields to improve the comprehensive usability of spaces, services, and products. UDL is an important example of how Universal Design can be extended and adapted to meet the needs of types, and even whole fields, of design that were not contemplated by the originators of the concept. The principles of Universal Design are intended to be broadly applicable to many types of design work, but for some specialized areas, greater elaboration or, in some cases, transformation is required to maximize the impact that the concept can have. Before the development of UDL, few educators had contemplated how Universal Design might be applicable to their work, but since its debut, it has been a significant part of the conversation about inclusion and accessibility for teaching and learning.

Though this adaptation to a new field is significant enough, UDL manages to also push the Universal Design concept in new directions. As David H. Rose and Anne Meyer of CAST have noted, UDL “extends universal design in two key ways. First, it applies the idea of built-in flexibility to the educational curriculum. Second, it pushes universal design one step further by supporting not only improved access to information within classrooms, but also improved access to learning.”²⁴ This second component comes down to the way that UDL draws attention not just to barriers that prevent students from making use of learning materials, previously the focus of accessibility

conversations, but instead also focuses on whether or not the design helps them to achieve their learning goal. This may seem like a subtle distinction, but it is a key difference because this is how UDL can help to ensure that educational content is inclusive of all learners and leads them all to achieve the same fundamental learning goals. Without this, educational content may be nominally accessible, as in the case of digital text that can be read with a screen reader, but there is no assurance that the students using the item will have an equivalent and meaningful learning experience.

An important aspect of UDL is the way that it presupposes that each learner will be different and that the learning materials should grant meaningful access to all learners regardless of these differences. As is the case with Universal Design, this means that UDL can have implications for a far broader population than typical accessibility efforts. Inherent to its design, UDL does not look to whether learners' differences are related to a disability, but instead seeks to offer successful options for all learners, no matter why they may approach learning differently than the student next to them. It facilitates this process by ensuring that students have access to "choices and alternatives in the materials, content, tools, context, and supports they use."⁵ Here flexibility, options, and alternatives are once again key aspects of inclusion, as is seen in other applications of Universal Design. As Mirko Chardin and Katie Novak note, "The UDL framework was designed to eliminate inequities, not perpetuate equality."⁶ The framework is not interested in including all learners in a uniform experience when it will not be a meaningful and successful experience for all of them. Instead, it is designed to offer varied pathways to equitable outcomes.

However, it is vital that the outcomes be truly equitable. UDL does not seek to lower the requirements or offer scaled-back options for some learners. Instead, it promotes offering approaches that understand learners as individuals with different needs and providing multiple ways for them to achieve the educational goals and outcomes. Andratesha Fritzgerald says it best, "The standard does not change because of situations or hardships. The standard is communicated, and the road to reach the standard is paved with flexibility."⁷ Through this approach, UDL is able to foster autonomy amongst all learners while also ensuring that the full spectrum of learners in any educational setting meet their educational goals.

As with Universal Design, UDL is much too broad of a concept to ask educators to apply without further guidance. To elaborate on the general concept of UDL and clarify the exact ways in which it would impact educational design projects, principles were developed, just as in the case of Universal Design. These principles, which are the subject of the next chapter, divide the types of changes that need to be made to educational materials into three

distinct categories. They provide further details that take UDL from the abstract to specific steps that educators can take to make their materials more inclusive and accessible for all learners. They also help to bring a focus to both the educational content and the learning goals to make sure that neither are forgotten during the design process. The structure and specifics of the principles are significantly different from those of Universal Design, but they offer the same sort of support structure for practitioners and serve as an excellent teaching tool for introducing the process of UDL to educators who are not familiar with it or Universal Design. As with Universal Design, these principles can also serve as the basis for a road map or checklist for those who want to ensure that they are considering the appropriate questions and issues each time they implement UDL in their educational design work. However, in the case of UDL, it is still important to ensure that the checklist serves only as a guide and is not a replacement for a thoughtful consideration of the needs of all. Otherwise, there is a risk that learners will be reduced to stereotypes or categories and the true needs of each individual will not be met. While a checklist can be a helpful prompt for those applying UDL, it cannot replace the work needed to design successful educational materials and experiences.

UDL and its principles can be applied by anyone designing or even selecting or evaluating educational content of any sort, from educational technology developers to classroom teachers. Even those who may not think of themselves primarily as educators can use the principles of UDL to create better ways of teaching skills and information to users through tutorials, instructions, and other content that may not immediately come to mind when considering educational design. This gives its applicability another type of breadth and increases the impact the concept can have. For libraries, this also means that UDL is applicable to a wide spectrum of types of projects. Its applicability to classes and tutorials may be more obvious, but the principles can also have a positive influence on the design of instructions for both patrons and staff, as well as decisions about collection development. This breadth of relevance is another way that UDL parallels Universal Design with its general appeal to those working on design projects of all types.

Though UDL is significantly distinct from Universal Design, many of the same goals and underlying ideals are at the heart of each of these concepts. Each offers the tools designers need to maximize inclusivity in their realm of expertise by providing concrete principles to guide inclusion work. Moreover, UDL rests squarely on the foundation that Universal Design provides, taking its central purpose from the instructions and ideals set forth by those who created and nurtured the original Universal Design movement into the highly influential approach that it is today. Understanding this core

relationship helps to clarify the purpose and goals of UDL and ensure that educators are using it to achieve its greatest potential.

WHY IS UDL IMPORTANT?

While there are many different approaches to improving inclusivity in curriculum design and education more generally, UDL has become particularly noteworthy. It is important because of the way that it represents a new means of thinking about inclusion and considering students who diverge from the imagined norm of the educator or educational institution. The creators of UDL challenged the standard approaches used by many educators, particularly at the time of its development, by bringing to the forefront “the realization that there is nothing ‘wrong’ with a particular individual who has not been learning; rather, the curriculum has been inadequate to meet the individual’s needs. The curriculum, not the individual, needs fixing.”⁸ UDL not only points out this problem in the traditional approach but also offers a possible solution to it. As such, it has the ability to offer important advances for educational design work and has an immediate and significant impact on all sorts of learning experiences, from elementary education to informal learning opportunities for adults.

Since the 1990s, UDL teaching tools have been available to help educators who want to integrate content designed around UDL principles in their classrooms. One of the first examples was a partnership between Scholastic and CAST called WiggleWorks™.⁹ This project, which resulted in a series of more than seventy early-literacy books which integrated with CD-ROM content, was designed according to the principles of UDL.¹⁰ Not only was the project popular, it has also proven to be effective. The Scholastic website notes that in a validation study by Dr. Lynn Hickey Schultz, “First graders using WiggleWorks made significantly greater gains on standardized reading tests and writing samples than comparison students.”¹¹ This partnership helped pave the way for the adoption of UDL by offering commercial products that were designed around its principles and by helping to publicize not only the concept but also the evidence that it was successful. Though this was an early example of UDL, it was an important one as it would go on to not only become a bestseller but to continue to be popular for over twenty years.¹² The popularity of this resource and others that were developed by CAST and others following the principles of UDL helped to make the concept more widespread and speed adoption by educators who were interested in the idea, but may not have felt comfortable or empowered to design their own UDL materials.

In the United States, UDL influence has been particularly significant because of the legislative impact that it has had. Just as Universal Design before it,¹³ UDL has been specifically mentioned in public policy documents and legislation, including the Strengthening Career and Technical Education for the 21st Century Act of 2018,¹⁴ the Every Student Succeeds Act of 2016,¹⁵ and the Higher Education Opportunity Act of 2008.¹⁶ Beyond legislation, UDL has also been influential on other governmental documents, including the US Department of Education publications.¹⁷ Across these publications, Universal Design and UDL are suggested as the preferred approach to ensuring equal access for students with disabilities and improving inclusion. This prevalence in the law and policy of education in the United States has helped to drive widespread adoption of the principles in both K–12 and higher education institutions and foster interest in the topic among educators of all types.

These factors have also helped to popularize UDL in the realm of educational technology with companies employing the principles to develop products that will further inclusion efforts and be enticing to campuses and institutions that are focused on inclusion and accessibility. Now UDL is frequently incorporated into tools and is often featured in promotional materials when it is present. One example of this is *Texthelp*, a company that offers multiple tools designed to incorporate the principles of UDL. Their website, which highlights how their products are designed for settings far beyond the traditional K–12 or higher education markets, also emphasizes how their *Read&Write* and *EquatIO* products “can change your UDL approach . . . [and] promote learner diversity and support individual needs.”¹⁸ With time, corporate use of UDL as a promotional tool has contributed to the spread of the concept throughout higher education as it helps to not only entice schools that are already applying UDL to purchase these tools, but also to educate other institutions about a concept they may not have previously considered. However, this does not mean that technology is a necessary prerequisite for the successful implementation of UDL. The guidelines can serve as a blueprint for instructional design even in environments that are completely free from technology.

As this suggests, another one of the strengths of UDL is the breadth of its applicability. While it is often thought of primarily in the K–12 setting or possibly in the classroom in higher education, companies such as *Texthelp* are not the only ones who are considering how UDL can be more broadly applied. UDL principles are designed so that they can be applied in all sorts of educational settings, even those that are more informal. They are equally relevant to one-off information literacy workshops, technology tutorials, and even creating written content that has less obvious educational goals. In fact, in situations where the goal is to pique the interest of those who are in

nontraditional, and not required, educational settings, the UDL framework has a lot to offer to make materials more engaging and informative for a wider range of learners. UDL has the potential to transform any educational content so that all participants are engaged, empowered, and successful.

Universal Design for Learning has successfully adapted and even extended the ideas and ideals of Universal Design into all types of educational settings. Its importance transcends its integration into the legal landscape of accessibility in the United States because of the way it helps to ensure that all students have equal access to educational materials and an ability to learn from those materials just as their classmates do. The framework is a major step forward for the application of Universal Design in all sorts of educational settings. For anyone who considers themselves an educator, the UDL framework has the ability to transform curricular materials and educational content in ways that ensure that it is versatile, accessible, and engaging. As more tools emerge that apply these principles, it is increasingly affordable and approachable to integrate UDL into the full array of learning environments without the need for specialized expertise or advanced training. This will continue to expand the role that UDL plays in educational content for learners of all kinds.

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Chapter Nine

The Principles of Universal Design for Learning

As is the case in Universal Design, Universal Design for Learning (UDL) can be difficult for new practitioners to apply without additional guidance. No matter how committed one may be to accessibility and inclusion, it is easy to have unconscious biases or to simply overlook important aspects of full inclusion. The principles of Universal Design for Learning represent an attempt to break the process down into more manageable pieces to foster more complete understanding and facilitate its use in a wide variety of educational settings. The principles add clarity and draw attention to elements that might otherwise be overlooked. These principles can also offer structure for the review and evaluation of programs, curricula, learning objects, and more. As with the principles of Universal Design, these principles can be very useful for those who are new to UDL as they help to make the steps to implementing UDL clearer and more approachable, and clarify the conceptual ideas behind this work. These principles will enable educators of all types to move from the idea of UDL to actual implementation in a way that supports and even extends the educational goals.

Developed by Anne Meyer and David Rose in 1998, the principles are intended to provide a framework and structure for UDL.¹ The three principles of UDL highlight the importance of providing different types of flexibility and customization in educational materials and learning environments, including the following:

- Multiple means of engagement
- Multiple means of representation
- Multiple means of action and expression²

At the heart of each of these principles is a focus on personalization, choice, and the integration of multiple different options that, taken together, offer flexibility for learners. As Rose and Meyer summed it up, “The three UDL principles share one common recommendation: *to provide students with a wider variety of options*. . . . Like universal design in architecture, with its stairs, ramps, and elevators, these alternatives reduce barriers for individuals with disabilities but also enhance opportunities for every student.”²³ When designing educational content using this framework, it is important to consider all three principles together so as to incorporate multiple modalities into each end product.

Applying these principles to the design of content related to instruction and teaching can ensure that it is inclusive for the widest possible array of learners. As Charlesia McKinney has argued, “Just as architectural designs indicate who is welcomed physically, intellectual models reveal which persons are anticipated to excel.”²⁴ UDL has the potential to ensure inclusivity when applied in a way that addresses both accessibility and equity in the design of instructional content. This can and should go beyond only considering a learner’s ability, to taking into account all the intersectional elements of each learner’s experience and situation, which can include, among other factors, “biology, family context, cultural background, history with schooling, socioeconomic status, moment-to-moment internal and external changes, and, most importantly, the context in which the learner is functioning.”²⁵ Narrowly targeting changes that will improve outcomes for learners with disabilities will miss the full range of opportunities presented by these principles.

Similarly, while many assume that UDL is focused only on supporting learners with disabilities, these principles can and should be applied in ways that create an environment that is supportive for differences of culture as well as ability. As Meia Chita-Tegmark et al. note, “Culturally informed educators are aware of the variability in types of knowledge, behaviors, and beliefs that learners bring to the classroom, and they create the cultural bridges or scaffolds that help students link their own thinking systems to those that are unfamiliar by offering multiple means of access into the subject matter, and multiple means to express knowledge and to engage with learning.”²⁶ Educators guided by these three principles have a structure available to them that can help guide them to develop curricula and other educational content that are in line with these goals. However, success in this work requires a clear understanding of the work behind each of these principles.

To create further structure around these principles, the same team at CAST developed guidelines for each principle, to prompt the appropriate action in implementing each principle to ensure inclusion. The guidelines offer additional guidance for the individual elements required to achieve the goal

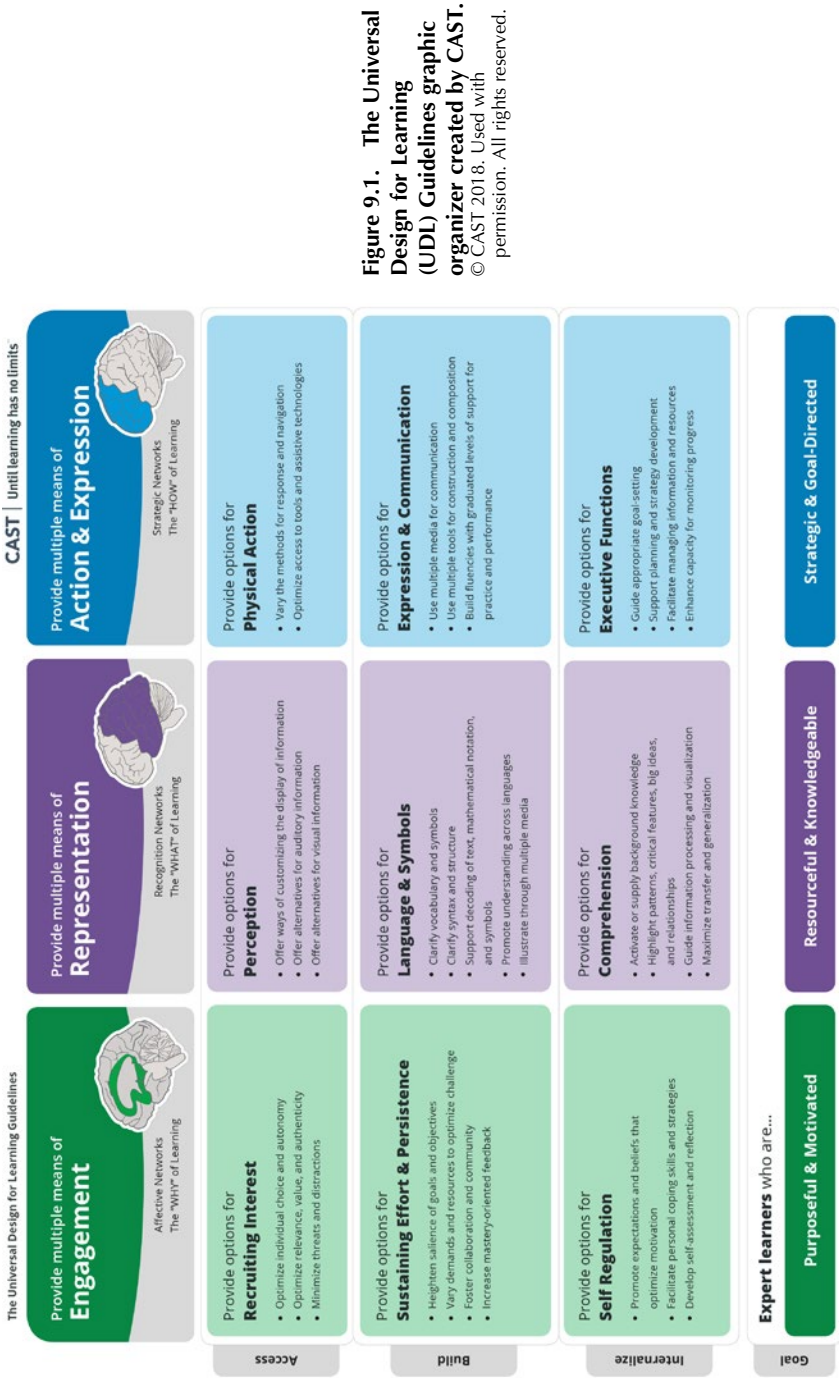


Figure 9.1. The Universal Design for Learning (UDL) Guidelines graphic organizer created by CAST.
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udlguidelines.cast.org | © CAST, Inc. 2018 | Suggested Citation: CAST (2018). Universal design for learning guidelines version 2.2 [graphic organizer]. Wakefield, MA: Author.

of the overarching principle, which, in turn, helps educators who are unsure how to implement the principles in ways that can offer support for learners with a diverse array of needs. As CAST explains, they “offer a set of concrete suggestions that can be applied to any discipline or domain to ensure that all learners can access and participate in meaningful, challenging learning opportunities.”⁷ Because they are designed with the breadth necessary to be useful in many types of educational settings, the guidelines can be of particular use to those who are unsure how to translate the elements of UDL to various types of library work. However, they are useful to educators and instructors of all sorts who are working to meet the needs of the widest possible number of learners throughout their curricula and learning environments. The core principles of UDL are explained below, with specific guidance on the implementation of this framework in libraries provided in subsequent chapters.

MULTIPLE MEANS OF ENGAGEMENT

Though the three principles of UDL can be presented in any order, the principle focused on offering multiple ways for learners to engage with the content is often listed first. There is a logic to this order because in some ways engagement is the foundation of successful learning. In referring to multiple means of engagement, UDL is highlighting the importance of organically capturing the attention of the learner and building buy-in for the educational activity, no matter what it is. It may seem obvious to educators why catching a learner’s interest is important. Particularly in the case of voluntary learning experiences, such as the programming offered at libraries, personal interest and voluntary engagement are key to convincing individuals to make the time to participate in these educational opportunities. However, the importance of organic engagement, not only at the beginning of the activity but throughout the experience, extends to all aspects of learning, even those where learners are required to participate or otherwise subject to external pressure.

Engagement can incorporate many different elements of the educational content, and learners may need very different types of support to remain continually engaged throughout a learning experience. The three guidelines associated with this principles help to provide a road map for the application of this principle:

- Recruit interest.
- Sustain effort and support persistence.
- Facilitate self-regulation.⁸

Considering each of these separately can provide a way to incorporate multiple approaches to engagement into each phase of any education design project. Taken together, these three guidelines cover engagement across the entirety of a learning experience. They also incorporate the development of skills that can serve the learner beyond the current topic. In this way, UDL can help prompt the inclusion of supports and scaffolds for new learning skills that learners can later apply in other settings.

The first guideline focuses on the process of initially attracting learners' attention and interest. The idea that learners can only attain optimal success when they have a personal interest in pursuing the learning and the ability to decide the outcomes of their learning is supported by the literature. Research demonstrates that there are many benefits to learners having intrinsic motivation, such as personal enjoyment or interest, rather than exclusively extrinsic motivations, such as a focus on earning prizes, grades, or money.⁹ This demonstrates that intrinsic motivation must be cultivated even where learners have external forces shaping their participation in any given activity.

Even when extrinsic motivation is central to the learner's decision to participate in a learning activity or environment, building in an element of individual choice and decision making can be key to improving educational outcomes.¹⁰ Research has found that for some learners, offering relevant choices within learning activities can be very important to both learner motivation and learner satisfaction.¹¹ Learning experiences that do not offer opportunities for participants to select from a series of options to customize their experience in accordance with their own preferences miss out on this opportunity to improve learning for all by capturing authentic interest at the beginning. This means more than simply offering multiple topics, but instead contemplating how to develop options that will be meaningful to the full spectrum of learners present in the group, taking into account the intersectionality of their identities. Options must not simply cater to different levels of ability, but also include topics for those with different interests, cultural backgrounds, and lived experiences, a process that not only recruits interest, but also makes for a more fulfilling learning experience for the entire group when they can also learn from their peer learners.

Recruiting a learner's interest also requires creating an environment that is conducive to all learners embracing and expressing their interests. This means that it is vital to have a welcoming and inclusive environment where learners feel safe to stretch and challenge themselves, something which is often not the case for learners of color.¹² Not only must the environment be supportive for those with disabilities and those needing various supports and assistive tools, but it must also be a safe space for learners of various races, ethnicities, genders, sexual orientations, religions, cultures, and other critical

elements of identity. Evidence suggests that both academic and interpersonal fear and stress can have negative impacts on learning outcomes,¹³ which clearly demonstrates that “[t]here can be no engagement if there is fear.”¹⁴ This is where it becomes important to remember that the “universal” part of UDL focuses on more than just learners with various educational needs. As Dr. Nantanoot Suwannawut states, “In other words, apart from individual preferences of learners, their socio-cultural backgrounds should also be taken into account when designing accessible learning environments.”¹⁵ Educators must not only confront their own conscious and unconscious biases to ensure that they are offering an inclusive experience, but must also foster an environment where learners do not feel threatened by either the instructor or the other students. Without this work, learners will never be able to act on their natural interest due to the external threat of negative reaction from those around them—a threat they may well have experienced in past educational environments. Supportive educational environments that build in intentional supports and protections for all aspects of student experience can help students to feel open to new challenges and to embrace interests that they may not have had an opportunity to pursue in the past.

In addition to appealing to the interests of learners to build engagement, it is also necessary to design with an eye toward sustaining this attention. There are many ways to accomplish this. An important piece of this is maintaining the connection to the elements that initially interested them in the activity, which is why UDL advises that it can be useful to “support [learners] to remember the initial goal or to maintain a consistent vision of the rewards of reaching that goal.”¹⁶ Moreover, it is vital to provide an environment that does not present unnecessary barriers to learners persisting in their goals. To this end, content should be designed so that learner challenge is optimized to a point that stretches and builds on their skills without being seen as frustrating or unachievable, which necessitates flexibility as this point will vary between users.¹⁷ Providing choices can play an important role in this process, as can fostering collaboration between students of different skill levels or interests to support one another and provide complementary skills. A final element of maintaining engagement is structuring feedback to be both constructive and explicitly focused on aiding with mastery, as opposed to highlighting errors or comparing performance to that of other learners. All feedback should support learning and help students to both improve their skills, ideally as oriented to their personalized goals, and also begin to develop the ability to reflect on and evaluate their own work on the path to expertise. This expertise should also be recognized as it is developed. As Lisa Delpit has noted, “The teacher cannot be the only expert in the classroom. To deny students their own expert knowledge is to disempower them,”¹⁸ and a piece of this is recognizing the

expertise they develop through their work in the current learning environment. This will not only empower the learner, but will also help to foster ongoing engagement.

Feedback that helps learners to develop this reflective ability leads naturally to the final guideline for this principle, which is focused on helping learners to develop their ability to self-regulate. This process starts at the beginning of the learning experience with the development of goals that can be personalized to be meaningful to each learner, building on the customization and choice already offered to recruit their interest. Beyond this initial step, it also continues through to support learners as they develop the skills to cope with confusion, questions, and mistakes as they arise, organize their own workflows, and reflect on their own work and honestly evaluate it against both personal and educator-provided goals. According to Meia Chita-Tegmark et al., “Options for pausing and for changing the order of certain tasks, embedded ‘down time moments,’ and structures that support pacing are elements that can contribute to restoring or preserving the self’s resources,”¹⁹ but there are many ways that these same skills can be integrated into all varieties of educational content. As with other elements of UDL, the key is to offer choice so that learners can find the solution that works best to support their own learning process and goals. These self-regulation skills not only ensure that learners will remain engaged with the content they are learning, but also leave them with skills that will support them throughout their life as they approach new topics and learn new skills.

MULTIPLE MEANS OF REPRESENTATION

In some ways, UDL’s call for multiple different representations of information may be the most self-explanatory and familiar of the principles. The concept of providing more than one format of information is a cornerstone of many accessibility efforts, ranging from providing captions for videos to offering Braille or audio versions of printed materials, making this principle one that many are familiar with and may already at least partially fulfill in their work. However, the principle goes beyond many of the initial accessibility practices that institutions put into place to cover other forms of representing information, including offering content in translation, taking into account the demands that special symbols place on learners, and considering that different learners may perceive information more quickly and effectively through different means. Beyond these benefits of supporting each learner’s most effective means of perception, this approach is also important because “learning, and transfer of learning, occurs when multiple representations are

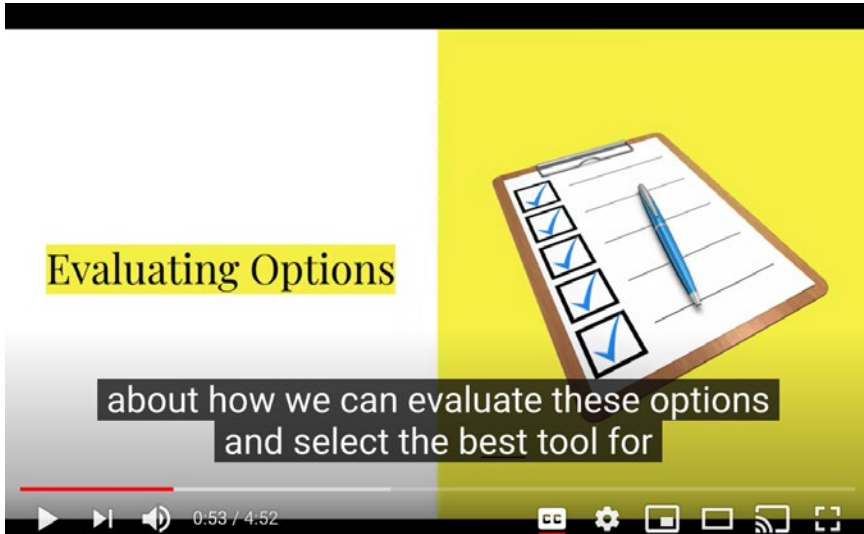


Figure 9.2. An example of closed captions.

used, because they allow students to make connections within, as well as between, concepts.²⁰ Though all aspects of UDL are often conflated with the use of technology in the learning environment, this principle may be the one that is most often seen as requiring technology since it has a focus on including resources such as video content. However, scholars such as Marcia Lyner-Cleophas have pointed out that low-tech methods of representation also exist.²¹ There are many ways for educators to be creative in considering how they can incorporate multiple means of representation into their content while going beyond simple video captions or automated translation tools.

In the case of this principle, three guidelines exist that serve as a useful reminder of how many different types of representation there are in most educational contexts. These guidelines ensure that the principle is applied in a way that goes beyond simply offering textual, visual, and auditory options to cover the support needed for learners to take in the information presented to them. To this end, the three guidelines are as follows:

- Offer alternatives for perception.
- Provide scaffolding for understanding language and symbols.
- Support meaningful comprehension.²²

Through thoughtful consideration of these guidelines, it is possible to develop content that will ensure that all learners perceive and interpret the information

presented to them successfully, which is a vital step on the path to impactful learning.

Those who are already familiar with common accessibility features, particularly in online content, may be familiar with some of the features incorporated when supporting alternate means of perception. One of the classic examples is offering the option for individual users to customize how information is presented to them, which is seen in many different types of software, both online and offline, from YouTube's option to slow down or speed up a video to the option to change view size offered in most modern word processors and browsers. Similarly, offering alternative types of information is also prevalent across many types of technology, as seen in the mix of text, video, and audio content that can be found in everything from educational computer games to online news sources. All of these are examples implementing the first guideline on alternative methods of perception, which recognizes and responds to the fact that individuals vary in which of their five senses they rely on to effectively perceive information, particularly educational content.²³ Whether due to varying levels of ability, differing environmental factors, or simple preference, it is important to cater to a variety of means of perception. By providing access to multiple types of representation, it is possible to meet the needs of learners no matter what their perception needs and preferences may be. The challenge is to push this beyond the currently obvious solutions (such as captions and customizability) to explore how the needs of other learners can be supported through even more types of representation, such as tactile representations of visual content or haptic representations of sound.

Beyond supporting differences in perception, it is also vital to ensure that the use of language and symbols does not create barriers for learners. Though on its surface this may seem straightforward, this guideline addresses ways to avoid unintentionally creating or perpetuating many different potential barriers that can prevent learners from achieving their learning objectives in divergent disciplines. This guideline encompasses the need to support comprehension of numerous means of communication, including languages, symbols, syntaxes, numbers, taxonomies, imagery, specialized jargon, and notation systems. Educators must thoroughly integrate scaffolds throughout their content to support learners in understanding not only the content being taught, but also any base knowledge being assumed by the choice of representations. This can mean providing content in translation into the learner's preferred language or integrating visual, audio, or textual glossaries in the learning content. Content should also be selected or designed so that the cultural backgrounds and experiences of all learners are represented. Where an understanding of this type of content is one of the primary objectives of the learning experience, educators should provide a structure that ensures that

learners develop the ability to understand and build on these concepts in other settings where these additional supports are not available. Guiding learners as they develop these strategies can be an important part of ensuring that they are able to later apply the learning in new settings.

In this process, it is important to remember, as Meia Chita-Tegmark et al. point out, that “culture provides the imagery systems, the reasoning structures, the analogies, and the relationships that have been developed by one’s social group.”²⁴ Assuming that all learners have the same reference points for abstract representations not only creates a barrier for learning, but also creates an environment of exclusion where the structure of the educational content itself suggests to some learners that they do not belong. To best serve all learners, support for developing the necessary understanding of this content should be directly embedded into the learning environment and educational materials so that it is available to all learners without the need for learners to self-identify as requiring further support.

Learning is about more than simply memorizing facts or developing the ability to respond to a set pattern of questions. As the final guideline for this principle emphasizes, it is vital that learners are supported in developing the deep comprehension necessary for skills and information to be transferable to other settings. This is the work of supporting students in ascending beyond the initial level of Bloom’s taxonomy, with its focus on remembering and understanding the direct information presented,²⁵ to develop the ability to apply and use new information in different settings and to novel scenarios. Educators must not only scaffold the comprehension of the basic information being taught, but also the skills to use this information. The first step in this process is integrating the skills of making connections between the information being taught and information that the learners already have access to, with the understanding that this will differ between learners. This can offer opportunities for learners to not only make their own connections to information they already possess, but also for learners to collaborate with one another to learn from peers who have access to different information that can contribute to the development of new connections. If educators handle this opportunity in a supportive and non-prescriptive manner, they can highlight the value of diverse backgrounds and experiences, demonstrate respect for these differences, and offer opportunities for learners to share how they are building on different information than their peers and what this contributes to their understanding of the materials.

Educators must also scaffold the process of identifying and extending patterns in the information presented. To do this, it is important to “provide explicit cues or prompts that assist individuals in attending to those features that matter most while avoiding those that matter least”²⁶ so that learners

begin to understand how to sort information and identify what is relevant to relationships between facts and concepts. This support is particularly important for learners who are new to the subject matter or have not developed the skills needed for processing information. Particularly in the case of those who do not have experience in this work, learners will “benefit from explicit instruction and practice on the strategies involved in the selection and manipulation of information so that it can be better summarized, categorized, prioritized, contextualized and remembered.”²⁷ Done well, this process can itself be a transferable skill that will support them in processing other new topics they may encounter. Ideally, the process will incorporate multiple means of representing these connections so that learners can perceive them in the way that makes the most sense for them, whether this means diagramming relationships or reciting patterns. In addition to ensuring an understanding of the underlying learning objectives, this work will allow students to develop independent skills that can be used in self-directed learning or in other formal educational settings.

Finally, to successfully apply this principle, educators must develop scaffolds for taking the knowledge that learners develop and transferring it to new problems and environments. An element of this process is understanding the way that this process will differ for individual learners. Support for retention, generalization, and application to new situations should strive to be authentically applicable to each individual’s reality in a way that will help them to understand the relevance to their own situation. This will improve learner engagement and comprehension while giving them a new set of tools with which to approach the world beyond this learning experience.

MULTIPLE MEANS OF ACTION & EXPRESSION

The way that learners participate in an activity or express their own learning is also an important area requiring consideration. As with the other principles, this principle demonstrates the importance of offering options that can support learners as they interact with and navigate both physical and virtual environments. For users with disabilities that impact mobility, this might mean offering different methods of physical motion over the course of a learning experience. For other learners, this may mean offering alternative ways to express and apply their learning that takes into account differences in comfort with communication methods. Regardless of the reason for the choice, educators and researchers have demonstrated that the key, as Rama Cousik and Heloise Maconochie note, is to respect “multimodal communicative preferences . . . as legitimate means of expressing their understanding—linguistic,

visual, audio, gestural and spatial” and encourage active involvement in the educational process.²⁸ This process extends from participation in the learning environment to the design and administration of assessments that offer flexibility to meet the needs of all learners.

In many learning environments, it is uncommon to provide support for alternatives with respect to both actions and expression. This makes the guidelines associated with this principle even more helpful in guiding educators through the process of rethinking their previous approaches which they may have taken for granted. These three guidelines are as follows:

- Offer opportunities for physical activity.
- Support multiple ways to express and communicate ideas.
- Scaffold executive function.²⁹

Though on their face these guidelines can seem quite different from one another, they are all about helping students to express their learning in a manner that is productive and effective. They are also geared toward demonstrating to learners that their own choices and needs with respect to expression are acceptable and welcomed in learning environments. As the research has demonstrated, the “confidence . . . to learn challenging tasks builds when learners have alternative examples of how to become competent and a sense that there is more than one pathway to competence.”³⁰ Respecting multiple different approaches to action and expression in a meaningful way can help to build this confidence and greatly improve the effectiveness of educational activities for all learners.

The first guideline related to this principle considers the role of physical interaction and its role in the learning environment. Physical interaction pervades virtually all educational contexts, even if these interactions can be overlooked because they are so prevalent. Examples include

- turning pages in a book,
- typing or handwriting responses,
- moving a mouse to navigate through electronic learning materials,
- raising one’s hand,
- painting or drawing a picture,
- using touch screens, and
- retrieving books or other items from shelves.

To offer an inclusive experience for all, it is important to evaluate each learning environment for any sort of physical interaction that is either directly integrated into the educational process or indirectly required to participate in

the learning environment. For each physical interaction that is identified, educators should consider whether there are alternative approaches that would either eliminate the need for this physical activity or would provide alternatives that learners could select according to their physical needs or personal preferences. At the same time, educators should realize that many assistive technologies are designed to allow users to take part in activities that are otherwise not immediately available to them. Educators should provide support for the use of external assistive devices in the learning environment, for example making reading materials available in formats that are compatible with screen readers, or educators may choose to integrate assistive technologies directly into the learning environments, as in the case of software that supports voice typing. Regardless of the approach selected, the key is to design an environment that is inclusive of learners' ability to physically interact in different ways.

It is equally important that learners are offered many ways to express their thoughts and questions throughout the learning process. This can serve multiple purposes. First, it ensures that students are equally able to participate without being singled out no matter their abilities. If opportunities to both speak and write questions and responses are supported throughout a class, then a student who is unable or unwilling to speak in front of the class will never feel excluded or fear sharing their contribution.

It is particularly important to support multiple means of expression in the case of assessments. Assessments that require a specific method of communication or expression are testing not only the learner's understanding of the subject matter, but also their proficiency with that mode of expression. For example, if handwriting is not the skill being taught, then requiring a student to write their response will present barriers not only to those with physical limitations, but also those for whom a spoken response would be more comfortable and effective. Allowing learners to select their own means of demonstrating their learning can more authentically evaluate their understanding of the materials, provide an inclusive environment for those with varying abilities, and lead to creative and compelling projects that may never have been considered in the design of the learning materials.

In addition to supporting the varied needs of learners, integrating multiple types of communication into a class can have the added benefit of helping all learners develop comfort with media that they may not have previously encountered. At a time when media literacy is even more important to daily life, creating an environment where students are able to create multimedia content and interact with multimedia content created by their peers as part of their learning experience can be an important way to build greater fluency in these different modes of communication and develop the ability to strategize about

how best to express information. Learners need opportunities to practice these skills with graduated levels of scaffolding and feedback that help them to build proficiency.³¹ This, in turn, can serve as the foundation for a greater ease with these materials in other aspects of the learner's life.

The final guideline focuses on supporting learners as they take active control of their educational experience by scaffolding executive functions. This is the work that will help learners develop strategies and techniques that will help them to succeed with the immediate learning activity but can also serve them well when translated to future learning. The first step in this path is to ensure that learners are developing meaningful and achievable goals. Too often learning goals are set for learners and are generic across an entire cohort. To support executive function and long-term success, it is useful to support learners in developing their own personal goals and objectives. This then leads to the next step, which is planning strategies to achieve these goals. Building opportunities for this work into learning environments will give learners a chance to practice these skills. This process can encompass multiple approaches, "such as cognitive 'speed bumps' that prompt them to 'stop and think;' graduated scaffolds that help them actually implement strategies; or engagement in decision-making with competent mentors."³² By incorporating goal setting and strategizing into the content of the learning environment, educators will have a greater ability to provide support and guidance for learners on the organizational and self-tracking skills needed to keep to the path the learners have identified for themselves. All of these steps allow educators not only to support those students who struggle with executive function, but also to help all students develop new strategies and processes for improving their own executive function in the course of the current learning experience and beyond.

By dividing and categorizing the core concepts of Universal Design for Learning, the principles described above can be a powerful tool for clarifying the meaning and use of UDL. As Jan D. Wilson notes, "Universal Design for Learning gives students and teachers the power to form new discourses that have the potential to radically transform restrictive ideologies and institutions and that create new, multiple understandings of the 'right' way to see, hear, think, and know."³³ These principles, in turn, can guide practitioners in their application of this concept in ways that maximize support for the new approaches by offering structure for creating new educational materials, experiences, and spaces. Because of their thoughtful design, the principles are widely applicable in all types of learning-focused environments, whether an elementary school classroom or a library program for adults. As Elizabeth M. Dalton argues, "UDL, through the simplicity of its three core principles, can provide guidance for designing and developing instruction for any educa-

tional situation and for all varieties of learners.”³⁴ These principles can also facilitate the appraisal and improvement of existing content.

To assist with this process, these principles have been used as the basis for a checklist intended to guide this type of evaluation and review, which is found in chapter 13. However, it is important not to oversimplify the application of UDL down to nothing more than a checklist. While the checklist can serve as guidance and support for the process, the goal should at all times be to broadly conceive of these guidelines in a way that enables designers to meet the needs of the vast array of unique learners who encounter their educational content. Only through this type of open-ended contemplation starting in the earliest stages of the design process can inclusion and accessibility be maximized across all types of educational design and programming. Ultimately, the focus of all such design processes should be to integrate flexibility and responsiveness to learner needs into all elements of the learning environment to create an experience that is not only inclusive of the widest range of learners possible, but also recognizes and values what each learner brings to their educational community.

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Chapter Ten

The Limitations of Universal Design for Learning

Since its development, Universal Design for Learning (UDL) has had a significant impact on the field of education and has gained many proponents, but it cannot be said that it has been universally accepted. The principles of UDL aim to make education more accessible and inclusive, but there are critics who argue that they have not achieved these goals, as well as those who think that they need to be pushed even further to achieve meaningful success. Understanding these different critiques of the concept can help in making a determination of where and how to apply UDL. It can also ensure that those who do adopt UDL principles and approaches do so in the optimal way to ensure that they achieve their goals of meaningful inclusion and accessibility. These criticisms are not necessarily a reason to reject UDL out of hand, but they do point to some ways in which UDL may need further development and offer food for thought for those who are interested in applying UDL in ways that take into account and address some of the limitations that critics have highlighted.

UDL IS TOO OFTEN CONFLATED WITH “LEARNING STYLES” AND MAY BE OVERSTATED

A central issue with UDL is that many educators and practitioners treat it as the same as the outmoded concept of “learning styles,” which remains popular among educators¹ despite the fact that it is unsupported by research.² Scholars such as Jay T. Dolmage also caution against approaches to UDL that rely too much on claims about how the principles and practices are related to specific areas of brain function. He argues that this “is dangerous first of all because there is really no scientific basis for such claims—no one has

actually studied brain activity during Universally Designed teaching, for instance. But within disability studies, we also know that such claims are most often used to infer deficits.”⁷³ Unfortunately, both of these approaches link the concept of UDL to controversial concepts that, at best, have little support and, at worst, in the case of learning styles, have evidence demonstrating that it is not true. Moreover, this presents a problem because it seeks to remove the concepts of disability and other types of social marginalization from the equation entirely. Instead of addressing the unique needs of each learner as UDL is designed to do, UDL can instead become simply a different way of categorizing learners without addressing key aspects of their particular situation. These approaches can also be another way of pointing to deviation from the “normal” rather than embracing the full range of differences seen between users. Any approach to UDL that seeks to set particular students apart as failing to fit into the norm or falling outside the average is working counter to the principles of UDL and undermines the advantage of this approach to education, which is fostering inclusion of all without the need to categorize or classify students.

Moreover, it is indeed a mischaracterization of the original meaning and principles of UDL. Scholars of UDL have been clear in stating that broad claims about neuroscientific support for the categorization of learners are not valid. As David H. Rose and Nicole Strangman note, “Recent advances in the cognitive sciences, and especially in the cognitive neurosciences, have made one thing abundantly clear—there is no simple way to characterize, or localize, cognition. . . . In fact, the explosion of imaging studies in cognitive neuroscience has demonstrated that none of these processes are truly coherent or localizable functions at all.”⁷⁴ While they do go on to discuss the importance of the three learning networks to Universal Design, the end result is that UDL should not be relied on to support the categorization of students or the over-simplification of the underlying cognitive processes.

Furthermore, recently there has been generally a degree of overstatement of the neuroscientific research supporting UDL. It is true that the concept “is grounded in cognitive and neural perspectives on learning,”⁷⁵ but in some cases, authors have simplified the concept in ways that may exaggerate the neuroscience support that has already been collected. Dave L. Edyburn traces some of this mischaracterization to the work of those lobbying for UDL’s inclusion in federal law, but clarifies that “without an adequate base of primary research, an analysis of research evidence that establishes UDL as a scientifically validated intervention is not possible.”⁷⁶ While this is certainly an avenue for ongoing and future research, at this point it is premature to argue that this level of validation is established. Any approach to UDL that is focused either on categorizing learners or on oversimplified approaches to the underlying

cognitive processes is likely to fail as it is based on a mischaracterization of the key research that serves as the basis for these principles.

THE RELATIONSHIP BETWEEN UDL & TECHNOLOGY

Some educators have raised concerns about the degree to which UDL focuses on the use of technology in educational settings. This raises concerns that may lead to resistance to the implementation of UDL principles. Some educators may feel that the technological aspect of UDL will displace the role of the instructor or result in students spending too much time using technology that is no more personalized to their needs than traditional educational resources. Others may be resistant to the idea of having to learn new technologies themselves and believe that it is impossible to implement UDL without this additional technology.⁷ These concerns can lead some educators to resist the move toward greater adoption of UDL and can limit its expansion and thereby its impact.

In contrast to this, some educators may embrace the technological aspect of UDL too much. As Dave L. Edyburn puts it, “I have often observed situations where teachers, administrators, and publishers claim they are implementing UDL simply because they are using multimedia or Web 2.0 tools. I disagree. I believe that there must be *a priori* evidence that the instructional designer understands academic diversity and is proactively building supports that will ensure that individual differences do not mitigate access and engagement.”⁸ Implementing the principles of UDL goes far beyond integrating new technologies into the classroom and must include not only a meaningful consideration of the role these technologies play in inclusion but also what other pedagogical changes must be made to complement these technologies. As is the case with other scholars,⁹ Edyburn does believe that technology is central to UDL¹⁰ even as he states that it is not sufficient, but this claim may overlook the many other ways that educators can create flexibility in the learning process without the use of any technology. While technology may play a role, it is not a solution in and of itself, and a piece of technology standing alone cannot be used to implement all aspects of UDL. As in all cases, new technologies can only serve as tools that help to achieve these large goals, not as the sole feature of them.

Another aspect of this concern about technology’s role in UDL has to do with the degree to which access to this technology is unevenly distributed. Scholars such as Jillian M. Duquaine-Watson¹¹ point to the ways that the digital divide, which has been described by the National Telecommunications & Information Administration as “the gap between the information ‘haves’

and ‘have nots,’”¹² may limit the impact of UDL to the extent that it remains focused on the use of technology to improve outcomes for diverse students and build inclusion in all educational settings. For as long as access to technology remains unevenly distributed, UDL projects that rely on technology will only be able to have a positive impact on those who have access to that technology, and therefore, diminish inclusivity, even unintentionally. This is hardly a problem that is unique to UDL. Unequal access to technology has wide-ranging problems, from preventing many with disabilities from accessing assistive technologies to students struggling to partake in online educational opportunities due to a lack of access to high-speed internet. During the COVID-19 pandemic, these problems came into particularly stark relief. Furthermore, there are concerns that adopting new technologies to the exclusion of older approaches may worsen inclusion if it eliminates modalities that certain users relied on with no adequate substitute.

However, despite these valid concerns about the way that many UDL projects rely on technology, it is important to note that UDL is not inherently reliant on technology. As Margaret King-Sears has argued, “UDL is not defined by or confined to technology. The technology must be combined with effective pedagogy, which can either stand alone as UDL or stand with the technology.”¹³ In fact, many scholars of UDL have argued that technology, and particularly assistive technology (AT), should not be an inherent focus of the implementation of the framework. As David H. Rose has said, “While there will always be a need for AT solutions, particularly for students with very significant and rare physical and sensory disabilities, the overreliance on them is often cumbersome, isolating, expensive, and educationally oblique.”¹⁴ As seen in projects highlighted in other chapters, UDL need not even involve technology and, when it must, it is most effective when the technologies used are those that are most familiar and broadly available. On the other hand, this is not to say that this feedback should be dismissed. Though it may not be needed in all situations, technology often is a natural focus of individual applications of UDL’s principles, and those seeking to apply these principles must keep in mind both the benefits and limitations of relying on technological solutions in this way. Moreover, educators who do not have access to specialized applications should not assume that this prevents them from implementing UDL. With creativity, the UDL principles can be applied even in environments without access to specialized tools and technologies. It is important that the reliance on new and innovative technology not get in the way of the larger goal of creating inclusive educational solutions.

UDL MUST EMBRACE INTERSECTIONALITY

Another critique of UDL is that it can focus on disability to the exclusion of other identities that students may have. As with Universal Design, UDL cannot succeed without acknowledging and embracing the many intersecting identities and forms of social marginalization of students. Some researchers have argued that “the UDL framework can be used to create a culturally informed curriculum that is useful to improving education of all learners globally.”¹⁵ However, this promise is often unfulfilled in existing applications of UDL, which tend to prioritize the needs of disabled learners and overlook other aspects of marginalization. One of the core figures in the development of the UDL framework, David H. Rose, has said that “the movement has been too balkanized and not integrated well with the other movements that are seeking to redress the various oppressions and inefficiencies in the way our schools are presently built,”¹⁶ which points to the need to look beyond the traditional focus on disability to find ways for the framework to address other issues that other movements have been separately addressing. To achieve inclusion, UDL must be applied in ways that truly grapple with all forms of marginalization that serve to exclude learners from fully participating in educational experiences, and UDL must find ways to integrate with other frameworks and approaches to education that can complement it and extend its impact.

In the article that prompted Rose’s statement, Federico R. Waitoller and Kathleen A. King Thorius have argued that “it is futile to dichotomize race and dis/ability or other markers of difference when addressing educational inequities”¹⁷ and that “UDL would benefit from cross-pollination with CSP [Culturally Sustaining Pedagogy] because it would take on a more critical and reflective stance in its notion of expert learners.”¹⁸ Rather than exist as a standalone framework, UDL must be used in tandem with other techniques such as CSP that allow educators to incorporate a more critical review of the way that students and their identities continue to be marginalized in educational settings, even as these institutions begin to implement UDL’s principles. Through this cross-pollination, they argue that “UDL may be extended to provide artifacts, structures, roles, and responsibilities that reposition and empower traditionally minoritized learners within cooperative learning groupings and thus sustain students’ identities with a critical stance.”¹⁹ This more fully developed approach would ensure that UDL is building meaningful inclusion for all students and is not simply extending the same troubling patterns to classrooms that are now nominally inclusive of students with disabilities. It would also ensure that educators are engaging in a more critical approach to designing curricula that are inclusive of all students when applying the UDL framework in their classroom. Andratesha Fitzgerald argues

persuasively, “There is no such thing as a learning environment that is truly universally designed and not culturally responsive.”²⁰

UDL’S CURRENT APPROACH TO DISABILITY IS INADEQUATE

Though UDL is, in theory, about embracing varying abilities and building educational experiences that are meaningfully inclusive for all socially marginalized students, some scholars argue that it falls short of this goal even in its approach to disability. As Federico R. Waitoller and Kathleen A. King Thorius have pointed out, scholars and practitioners of UDL alike persist in using the same language through which “students are positioned at opposite ends of an ability continuum,”²¹ even as they claim their wish to eliminate the view that students with disabilities are lesser than their counterparts. In order to build a truly inclusive approach to learning and education, scholars and practitioners alike must not only be more cautious in avoiding problematic language that implies inferiority, but must go a step further to be expressly critical of systems that presuppose or are based on the language of inferiority. Those applying UDL to educational experiences of all types should ensure that they are truly breaking free of the biased assumption of an “ability continuum” rather than simply re-creating this traditional approach to disability into a new framework that claims to be built around inclusion.

Beyond the use of problematic language, UDL may not go far enough in creating space for and encouraging the redesign of the historically limited content of most educational settings. Inclusive content is vital to creating an inclusive educational experience. This means teaching about the full diversity of the world so that all learners can see their place in the subjects, whether this means teaching disability history, the role of people of color in STEM fields, or any other aspect of diversity. However, this element is not frequently considered and does not receive adequate focus in the implementation of UDL. As David J. Connor and Susan L. Gabel argue, “Educators must move beyond the acceptance of disability as diversity, and actively teach about it, including its history, its culture, and the ways in which many people are disabled by physical and attitudinal barriers” in order for UDL to be successful.²² To be fully inclusive and acknowledge the intersectional identity of learners, this focus on content should look not just to disability, but to all aspects of identity. Implementations of UDL that ignore this important aspect of designing inclusive educational content will miss an opportunity to not only build greater inclusivity, but also to broaden learners’ understanding of the world around them and their place in it.

INSUFFICIENT DIVERSITY AMONG EDUCATORS IMPLEMENTING UDL

One noteworthy criticism of UDL is that there is not sufficient diversity among the practitioners who are implementing its principles. While this critique could be levied at many, if not all, aspects of the education system, some scholars have argued that it is particularly relevant to the impact that UDL can have on learners. As Gayitri Kavita Indar notes, “The continued lack of workforce diversity in education is problematic for the efficacious utilization of UDL, increasing UDL’s risk of reproducing the historical and structural barriers that disadvantage marginalized learners.”²³ Without diverse teachers, there is no clear reason to believe that the goals of UDL can be achieved. Jay T. Dolmage goes further in his analysis of the application of these principles in a higher education setting, stating that

the explicit suggestion to hire or employ diverse faculty becomes a tangible way to remove barriers. It will not be enough to “just” utilize Universal Design in academies where we know the faculty and instructors do not look like and do not come from the same cultural backgrounds as the students. If we do, we are simply retrofitting another academic fad onto a highly exclusive machine. If we make the “interest convergence” argument that UD is just good for all students, we ignore the different pathways that bring students to our classrooms, or keep them from getting there, and we may even reproduce these exclusions.²⁴

For a set of principles specifically aimed at inclusion, this is a very serious potential problem. It suggests that an important priority for those seeking to expand the impact of UDL in a variety of educational settings should be supporting and developing a diverse community of educators who are applying the principles in a way that builds inclusion for all students. Without making this a core element of this work, it will not only never achieve its goals of inclusion but also will never amount to more than the fad that Dolmage fears it could become.

Considering these critiques of Universal Design for Learning is an important part of fully understanding the concept and appreciating both its advantages and disadvantages. Without contemplating these limitations of UDL, it is impossible to make a fair determination about whether it should be applied in particular situations. Moreover, these criticisms point to areas in which Universal Design can be further developed and address pitfalls that should be avoided when applying the principles. Without a full understanding of these, UDL is likely to be applied in ways that ultimately will fail to achieve its inclusion goals. This makes it vital that those interested in bringing UDL principles to their own education efforts take the time to understand the limitations and criticisms of the concept before adopting UDL in their own work.

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Chapter Eleven

Applying Universal Design for Learning in Libraries

Universal Design for Learning (UDL) is most frequently thought of in classroom settings at all levels from elementary school to postsecondary education. However, its principles can inform and guide the development of all types of educational and instructional content, whether for formal or informal education. As institutions that are focused on both self-directed education and librarian-led instruction at many levels, the principles of UDL can be applicable in a variety of settings at all types of libraries. One of the reasons that UDL is useful in a library setting is that those working in libraries, in particular, rarely know if their patrons have disabilities. Given that students with disabilities may not always disclose their disability to their schools or request accommodations, this may also be the case for instructors at all education levels. However, even if a patron has requested an accommodation or otherwise disclosed their disability in the course of their employment or education, it is unlikely that the library will have access to that information.¹ Apart from this lack of knowledge of a patron's needs, any system that requires that individuals request an accommodation to be able to receive services is by its nature exclusionary. It forces individuals to disclose private information, oftentimes requiring individuals to incur the cost and inconvenience of a medical evaluation to provide documentation about one's disability (which in turn, ties in to broader questions regarding equitable access to health care), and the time and resources needed to navigate the bureaucracy involved in requesting an accommodation.

Whether a librarian is tasked with designing materials to help corporate researchers work more efficiently, developing collections to support those interested in lifelong learning, or creating programming for the library's youngest patrons, UDL can help provide the tools needed to ensure an inclusive and effective learning experience for learners with varying needs and preferences.

By offering a narrower and more specific framework for the consideration of some of the elements of the broader concept of Universal Design, UDL can be very helpful for those who are struggling to identify the specific ways that Universal Design might apply to the elements of library work that are not focused on spaces and facilities. The guidance provided by the principles of UDL offers a road map for improving the inclusiveness of all types of library work that relate to patron learning and the learning outcomes, both formal and informal, for patrons of all types and ages. In this way, UDL can provide vital support for this work in many functional areas of librarianship that may not have previously felt that Universal Design was easily applicable to their design work and day-to-day activities.

CREATING AN INCLUSIVE ENVIRONMENT

At the heart of Universal Design for Learning is an understanding that learners must feel that they are in a safe and supported environment to be meaningfully engaged and included. This is central to building user engagement as feelings of threat and distraction will prevent learners from successfully initiating and maintaining the focus needed for learning. To develop an environment that supports all learners, the library community must first be a place that explicitly values diversity and prioritizes inclusivity. Without this, it will be impossible to apply UDL in ways that will be successful, because the efforts will be built on a foundation that cannot provide a safe learning environment for all. The first piece of this work is to evaluate the current environment of the library, including both patron-facing and library-employee-facing aspects of that environment. This should be more than an internal effort and should include opportunities to offer anonymous feedback through multiple modalities so that the evaluation is objective and thorough. This process will help to identify barriers and exclusionary practices that may have previously been overlooked.

It is important that after the evaluation phase, the library makes immediate changes to address issues that are identified and adopts an ongoing commitment to iterative improvement in this area. As Katya Pereyaslavskaya and Corinne Abba suggest, “This includes pledging a public commitment to the principles of dignity, independence, integration, and equal opportunity, which motivate us to continually identify, remove and prevent barriers and to foster an environment in which everyone has increased opportunities to participate in our community.”²² It likely will be valuable to make this pledge a public statement, potentially even as part of a larger effort at documenting the standards that the community will hold itself to, such as a code of conduct for both patrons and employees, or a diversity statement with specific, action-

able plans to support marginalized individuals, particularly those who have been underserved in the past, or a diversity strategic plan.³ While these types of documents are not sufficient in and of themselves to improve inclusion in the library, they can “help[] librarians direct their efforts in making services and buildings more welcoming and inclusive and communicate[] these efforts to library personnel, university administration, and patrons.”⁴ As such, they are worthwhile undertakings for libraries of all sorts as one piece of a larger commitment to creating safe and inclusive spaces for all patrons.

Once this documentation is in place, the work is not done. Libraries must continue to prioritize initiatives that support inclusivity and equity so that all members of their community are supported and involved. Moreover, they must critically evaluate their existing practices to consider how they may be excluding some members of the community. For example, evaluating how they might “universally design the celebration of holidays”⁵ is important for many libraries that currently observe only a limited number of religious and cultural holidays in ways that do not reflect the full diversity of their communities. There are many ways that this work can be done, but it is important that it be focused on supporting the full spectrum of identities of the library’s patrons. Another important aspect of creating an inclusive environment is building a library staff that is able to offer a welcoming experience for all patrons. There are two distinct elements to this process: recruiting and retaining diverse staff and offering training to ensure that all staff members have the tools needed to support all patrons. Both are equally important to developing a space that is welcoming for all. Some libraries have found particular success with hiring librarians who are specifically tasked with this work as their primary focus.⁶

Libraries can be very intimidating, even anxiety-provoking spaces for some patrons,⁷ particularly academic libraries,⁸ and doing the work to create an environment that is explicitly inclusive and welcoming can be a major factor in these patrons feeling comfortable visiting the library and, in turn, achieving their own personal learning goals. Details about the best ways to create an authentically welcoming space for all patrons would fill an entire book and are beyond the scope of this chapter. However, it is vital to remember that offering a nonintimidating and inclusive environment is at the very foundation of the principles of UDL, and other efforts are unlikely to achieve their potential without doing this work.

PROGRAMMING

No matter what age-group a library program is targeting, the UDL principles can prompt design choices that will make the program more inclusive. Some

research suggests that libraries are beginning to apply these principles to programming, particularly when designing programs for children, but unfortunately, frequently this is limited to cases where the programming is specifically designed for a known population of disabled participants or designed in response to requests from members of this population.⁹ It is important to remember that one of the advantages of UDL is that it can benefit a wide range of patrons, not only patrons with disabilities, and that libraries usually will not know in advance whether some of their patrons are disabled. Beyond this, true inclusion cannot be achieved if the only programs that are designed according to the principles of accessibility and inclusion are those that are targeted toward individuals who have disclosed that they have one or more disabilities. A better approach is to create workflows and design processes that incorporate these principles in the design of all library programming. As Carrie Scott Banks et al. note, “Scrambling to change the craft project so an unexpected child who is blind can participate stigmatizes the child. Having a craft project that does not rely entirely on vision already set up sends a completely different, welcoming message.”¹⁰

Because most library programs have at least some educational component to them, this area of library design is perhaps the most natural fit for these principles. Given this, it is not surprising that all of the principles, in their entirety or at least partially, apply to the design of library programming. As noted above, it is important to consider each of the principles early in the design process, and it may be helpful to look to other educational settings for inspiration. However, there are a few concepts that will apply to most programming:

- If the program will offer an opportunity for any responses or questions from participants, there should be multiple different ways to participate in this element, which could include emailing the contribution in advance or during the session, speaking into a microphone, or passing a piece of paper with a comment.
- The program should offer ways for participants to participate using (or not using) more than one sense. For example, if a video will be shown, it should be captioned and the captions should be on for all participants to view without the need to place a special request.
- Distractions should be kept to a minimum. If the nature of the program means that this is not possible for all participants, it is worth considering whether a special designated location can be set aside for participants who would like to minimize distractions. Consider whether headphones can be made available for patrons who are easily distracted or otherwise need assistance hearing the program.

- The learning goals should be made clear and, if possible, participants should be able to choose from more than one goal at varying levels of challenge.
- When teaching a new skill, advice should be given on how to develop independence with the skill. For example, how might participants transfer this skill to other realms or troubleshoot when continuing with this project on their own?
- Supports should be provided for any terminology, symbols, or other content that might be confusing. This could be in the form of a glossary handed out at the beginning of the program, for example.
- Where relevant, patrons should be offered the option to continue to build on the topic covered in multiple languages and multiple types of media. For example, if a resource list is distributed, include content in more than one language and offer a mix of print, video, and audio content.
- Remember that some participants will likely be using assistive devices and design the program in a way that makes this possible.
- Consider offering options for discussion and collaboration. Even if this simply takes the form of setting aside a few minutes before the question-and-answer period for patrons to turn and discuss the program with their neighbor, this can still add an element that will improve the learning experience for many participants.
- Integrate movement into programming when possible. Though it may not be relevant for every program, be creative about offering options for movement, for example, a tour of a space or a chance to wander around to different tables set up around the room.
- Remember that the principles of UDL apply to all ages. Too often practitioners think of UDL primarily as a way of supporting young learners, but it is just as effective with adult learners. As T. Nicole Tucker-Smith notes, “One of the reasons adult learners are so variable is because of their prior experience, the lives they’ve already lived through, the lessons they’ve learned, and by using the UDL guidelines to strategically design multiple means, and consider adult learner variability, then we can build on those prior experiences, and design rich learning opportunities.”¹¹

LIBRARY INSTRUCTION

The first topic that probably comes to mind when considering UDL in a library context is the instruction program, in particular for academic and school libraries. While this is a subset of library programming, and much of the same advice applies, it is worth considering this topic separately because

there are specialized topics that are relevant to library instruction sessions. Whether offered for credit or as a standalone session, offered either on a voluntary basis or integrated into the class curriculum, these types of programs represent the most direct example of learning in a library setting. Though they may not have full instruction programs, specialized libraries also often offer some form of formal or informal educational programming for patrons. Even the types of short-term instruction that happen at public service points can benefit from an understanding of the principles of UDL. Unfortunately, not all libraries have taken advantage of this framework to design inclusive learning experiences. A 2018 study of “visible evidence of inclusive practices in library instruction programs” by Stephanie J. Graves and Elizabeth German found that “evidence of disability inclusion was not readily apparent on the majority of library instruction websites.”¹² While it is possible that some of these programs simply did not mention their efforts on their websites, the reality is that many library instruction programs are not designed with accessibility in mind or, even if they are, do not meet the needs of the full spectrum of learners in their community.

Regardless of the form of organized instructional program and content that the library offers, it should be designed with a careful consideration of the principles of UDL. As Katy Kavanagh Webb and Jeanne Hoover argue persuasively, learners “bring their own learning preferences and abilities to the library when seeking help. It is important to meet their information needs with tutorials that keep their attention and give them multiple ways to interact with the information presented.”¹³ Libraries must strive to offer users multiple options to engage with information literacy and library instruction in ways that will meet not only the user’s needs but also their preferences to achieve the full potential of the library instruction program.

In the case of instruction programming, during the initial stages of design, the librarian should methodically consider each of the UDL principles and identify and record how each will be addressed or why specific principles are not relevant. This document will provide a guide for the next stages of design and for evaluating the project after it is completed. In addition, creating a record of this planning and, particularly, the reason that some principles may not be addressed, will minimize oversights and assist with the process for future design projects. This process can be put into effect for the design of all types of instructional content, from the materials for in-person instruction sessions to interactive tutorials to online instructional videos.

There is evidence to suggest that the thoughtful incorporation of the principles of UDL into library instruction can improve student engagement and satisfaction with library instruction for all patrons. When conducting a survey of students who attended an instructional session redesigned using UDL prin-

principles, Ying Zhong found that the “results suggest that although the number of students who reported disabilities represented a small number in the class (three out of fifty), the majority of students reported benefiting from UDL-integrated instruction.”¹⁴ In their work on tutorial creation guided by UDL principles, Webb and Hoover similarly found that students were enthusiastic about the new approach.¹⁵ Combined with the evidence of the benefits of UDL in other classroom settings, this suggests that libraries will find meaningful benefits from designing instructional content using these principles.

ONLINE CONTENT

Libraries often maintain an array of different types of online content created by the library which may include, to name just a few, websites, repositories, and asynchronous tutorial and instructional materials. In some cases, this content may even be spread across multiple platforms or content management systems. Regardless of the precise structure of a library’s online content, Universal Design for Learning can offer a framework for making the content more effective for all patrons. While it may not always be possible to control the accessibility of content purchased from vendors, when the library is the entity creating the content, inclusive and accessible design must be a top priority. As Jennifer Turner and Jessica Schomberg have articulated, “If we as a profession do not design our resources to be inclusive of as many people as possible, we may be creating barriers to learning instead of offering pathways.”¹⁶ Though their article focused on document design, their call for intentional design with a focus on “how users will interact with our documentation”¹⁷ is in many ways applicable to the creation of any type of online content.

One of the central advantages of well-designed online spaces is that they can support a level of personal customization that can be difficult to achieve with physical materials. Online spaces and content designed by libraries should always seek to maximize these sorts of options for individuals, permitting them to modify the experience to meet their own needs. There are many ways that features can be added to online library content to support this:

- Adhering to web accessibility standards such as WCAG 2.1 to support users navigating and using the content using their own optimal techniques, whether these involve assistive devices or not.
- Integrating tools that allow patrons to display the content in ways that work best for their needs, such as automated translation and text resizing tools.

- Offering content in multiple means of representation whenever possible and making discovery of all formats straightforward and user-friendly.
- Featuring content that appeals to diverse interests, learning preferences, means of perceptions, and difficulty levels, in order to offer engaging options for the widest possible range of users.
- Offering multimodal options for feedback so that patrons can get in touch easily if their needs are not being met.
- Ensuring that all interactive content, such as chat reference features, not only meets accessibility standards, but allows multiple means of action and expression.

Through thoughtful and intentional design choices, online content can be usable and appealing to patrons with all kinds of needs and preferences. The important part is to remember to integrate this work into workflows so that it is done consistently and at every stage of the design process, rather than being left until the end when major issues need to be fixed as an afterthought. When the UDL framework is at the center of the design of online content, it is possible to create beautiful, usable, engaging content that will better serve the entire library community and will demonstrate the library's commitment to inclusion.

PUBLIC SERVICE POINTS

Public service points such as desks that provide reference, circulation, and other support services are sometimes designed in ways that take the principles of Universal Design into account, but the UDL framework can also help to inform how to structure the services offered and train staff who will interact with patrons at these locations.

The principle of multiple means of representation should inform not only the design of face-to-face public service interactions, but also the systems that support remote interactions. When there is a need to explain complicated actions, such as using a self-checkout machine, or the navigation of physical or online spaces, such as the library stacks or online catalog, it is important to consider offering this information so that it can be perceived through multiple different senses. Often this may mean video demonstrations of the processes in question, but in some cases other options may also be helpful, such as offering tactile maps of the library.

Considering multiple means of action and expression when designing these services can point to the need to offer more than one way for users to express their needs and interact with staff and systems. For example, remote access

options such as online chat, email, text messaging, and even phone-based services can all serve different groups of users. Chat, email, and text messaging services can be particularly helpful for users who may not feel comfortable communicating with staff face-to-face for a myriad of reasons ranging from social anxiety, social distancing requirements, or a lack of comfort speaking the language in which services are provided. It is also helpful for staff at these public service points to be familiar with common assistive technologies and comfortable assisting patrons who are using these tools.¹⁸ More than merely being ready to assist those who are already using these tools, it can be useful for staff to have an understanding of free and low-cost assistive tools, ranging from screen readers to apps that support executive function, so that they can recommend appropriate supports to patrons who may benefit from these tools. This can be particularly helpful as many patrons who do not consider themselves disabled may nevertheless benefit from the use of these tools, and even among disabled patrons, there may be limited knowledge of the free alternatives to better-known, high-cost assistive tools, which may be out of their reach.

COLLECTION DEVELOPMENT

At all types of libraries, the library's collection is central to patron learning. Even if the library is not affiliated with an academic institution, patrons use the materials purchased and held by the library to pursue their own personal learning goals, making the principles of UDL relevant for those tasked with developing those collections. As Axel Schmetzke pointed out, "When librarians get together and decide to procure a specific online information resource, they not only determine what new content is to be put out there, but also (often unknowingly) who will, and will not, have access to this content." However, his preliminary research also indicated that all too frequently, features that promote inclusion were not the focus of the decision-making process.¹⁹ Fortunately, some library associations and individual libraries are beginning to consider the ways that Universal Design can inform the collection development process.²⁰ In order to improve accessibility, collection development staff should consider moving beyond reliance on vendor statements about accessibility or even testing based on minimum standards to incorporate the principles of UDL into a thorough evaluation of items to be purchased for the collection.

The principle of providing multiple means of representation has, perhaps, the most obvious relevance to collection development processes. It is important not only to ensure that common accessibility features related to perceptions such as captions and, increasingly, audio descriptions, are available, but

also to provide options for alternative formats of information, such as audio, visual, and video content. Options that offer customization should also be given preference, such as databases that have built-in options for changing the size of the text or otherwise altering the way information is displayed, as well as those that have integrated dictionaries, glossaries, translations, and other scaffolding tools. This principle should also extend to providing access to audiobooks, large print, and other alternative formats that support different means of perception whenever possible. In general, it is important that collection development work prioritizes offering multiple ways to perceive the information that is being presented. These approaches will not only ensure that patrons with disabilities have more equitable access to library collections, but will also provide options for all patrons to have more satisfying and successful interactions with library materials.

Many people tasked with purchasing items for libraries already consider some of the elements of offering multiple means of action and expression even if they have never considered them through a UDL lens. Anytime a database is evaluated for its accessibility to assistive tools, it is being evaluated under at least one element of multiple means of action and expression. However, there are still other ways that the guidelines related to this principle could help to structure and expand the way that items are evaluated. In particular, the types of assistive tools and adaptive workflows that are supported should be thought about more creatively. Often, this work has been based on requesting assurances, usually in the form of a Voluntary Product Accessibility Template (VPAT) from vendors, and possibly some internal testing of the product, often using automated tools. However, those efforts can fall short. In particular, research suggests that VPATs are often inaccurate²¹ and automated testing tools can also fall short.²² Those working on collection development should embrace UDL's calls for flexibility, customization, and support for a wide range of assistive technologies by considering these aspects of design more broadly. As an Association of Research Libraries (ARL) Task Force noted in their 2012 "Report of the ARL Joint Task Force on Services to Patrons with Print Disabilities," one way that libraries can do this is by "advocat[ing] for content portability so that users can use the devices they prefer."²³ Though several years have passed since the release of this report, this remains a common issue with electronic resources and is therefore still valuable advice. Additionally, consideration of the additional features offered by vendor products through the lens of UDL can reveal new ways to offer support for patrons. For example, tools that offer features that help organize, categorize, and annotate resources can be extremely useful for those who need additional support with executive function. Selecting on the basis of these features and ensuring that patrons are aware of them can offer

a more inclusive and supportive experience for a significant segment of the library community.

The principle of offering multiple means of engagement is also relevant to collection development decision making. Some of this work is already done without necessarily being named as UDL-related work. For example, the process of evaluating the usability and overall design of many items considered for library collections implicates the principle of multiple means of engagement, particularly as it pertains to minimizing distractions. However, this principle can also be an important reminder that it is vital to build and support diverse collections that feature creators who represent the full diversity of human experience. Without this diversity within the collection, libraries will struggle to recruit and retain authentic interest and engagement from patrons, which will negatively impact their learning and, potentially, also their level of library use more generally.

To ensure that these ideas remain at the forefront of the collection development librarian's mind when evaluating resources, it may be useful to integrate these concepts into workflows, policies, and standard language shared with vendors. As discussed before, the application of these principles cannot be entirely boiled down to a checklist, which may miss nuances in any given situation. However, it is valuable to develop supports and tools for those who will be tasked with applying the principles in new ways in their work, even if these materials are not exhaustive. Such documentation can be particularly helpful if it assists in the process of prioritizing not only the different features that are desirable in an item being evaluated, but also where this piece of the evaluation fits into the overall review of a resource that is being considered for purchase. Because very few resources will include all desired design features, it is important to offer assistance in weighing various features to avoid frustration and to support consistent decision making.

OUTREACH AND MARKETING

The principles of UDL can also be helpful in guiding the creation of more engaging, accessible, and inclusive outreach and marketing materials both online and in print. In some ways, this work parallels the principles applied to online communications. Beyond making sure that all outreach and marketing materials follow accessibility best practices for the medium they are presented in, there are several steps that can be taken to improve these materials through the principle of UDL. First, it is key to consider conveying the message in multiple modalities and, for online marketing, across multiple different platforms. For example, for an upcoming themed story time or the

debut of a new platform for online reference services, a library should consider doing outreach in their print newsletter, through a video that could be posted online and played on screens in the library, via flyers handed out at the library, and on social media platforms. In the case of outreach and marketing materials, it is even more important to recruit authentic interest since individuals are not required to pay attention to the library's marketing materials.

Second, language should be simplified. When syntax, vocabulary, and structure are clarified, the message will be more comprehensible by all patrons, including not just disabled individuals but also those who are not fluent in the language of the material and those who are distracted or glancing at the item briefly. Additionally, to support those who are more comfortable in other languages, it is worthwhile to consider how materials can be designed to better support those who speak languages other than the language of the outreach materials. As an example, when designing promotional materials for upcoming special events, a library might create postcards with text in multiple languages, offer subtitles on promotional videos in all the languages common in the local community, and offer sign language interpretation for promotional video content and the event itself, to name just a few alternatives.

Third, the photos, clip art, icons, and other imagery used in outreach materials should represent the entire community. This means focusing on finding artwork and photos that include individuals of all races, ethnicities, genders, and religions as well as featuring individuals with disabilities. Ideally, the library can take an active role in building a collection of diverse images taken at library events and in library spaces that can be used, with permission of those photographed, in future outreach and marketing materials. Finally, be sure to include contact information on all outreach and marketing materials so that patrons can inquire about the supports and inclusive services that the library has to offer. All of these actions will help to reach a wider range of library patrons and can also help to signal to patrons that the library takes their needs seriously.

As a framework designed for educational settings, UDL has much to offer librarians across a range of institutions and specializations. Though often thought of as relevant primarily to instructors in classroom settings, the principles of UDL can be applied far beyond these traditional settings in any institution with educational aims. As such, they are particularly relevant to libraries that are working to support both formal and informal lifelong learning for their patrons. Whether a particular library function is labeled as educational or is made up of formal instruction sessions, it is likely to touch on learning directly or indirectly. Even the most entertainment-focused aspects of library services often offer at their core an opportunity for personal growth and education. By recognizing all of the ways that library work touches on

teaching new information and helping patrons to learn about new topics and skills, it becomes clear how UDL can guide the delivery of these programs, services, and materials. It is important to think broadly about both the idea of learning and the UDL principles themselves when identifying the opportunities that they provide for building greater accessibility and inclusion into all aspects of libraries.

This chapter offered examples of some of the ways that the UDL framework can inform and contribute to library initiatives and projects, but it is far from an exhaustive list. The principles of UDL, much like the principles of Universal Design, can offer helpful guidance to all sorts of design projects both within traditional library services and as libraries debut new service areas, technologies, and specialty spaces. Hopefully the descriptions and examples provided here will be transferable to new environments as they are developed. Even in situations that are not on their face instances of instruction or learning, UDL can help to ensure that design decisions are made in a way that centers on inclusivity and support for patrons with disabilities.

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Chapter Twelve

Universal Design for Learning Case Studies

Libraries are fundamentally centers of learning and education no matter which type of community they serve. Whether this takes the form of formal instruction sessions, story times for young children, online tutorials, or even simply the library's collections and resources being used for personal learning, most everyone who comes to the library, virtually or in person, does so to learn. As a result, there are many different ways that libraries can apply the principles of Universal Design for Learning (UDL) to expand their reach, include all patrons in their offerings, and have a greater impact on their community. Due to this wide range of ways that UDL can be applied, it can feel complicated and overwhelming to begin to integrate these principles and approaches into specific workflows and designs, particularly for those with limited instructional design experience. However, there is no reason that this process needs to be intimidating, especially given the amount of flexibility that is built into this work.

This chapter offers examples of how libraries serving different populations and working in different settings have approached this challenge. These case studies demonstrate just a few of the many ways that UDL can be successfully integrated into different aspects of library work. They represent how UDL can be used in three different types of libraries, but these are hardly the only types of institutions that can benefit from this approach to educational content. These case studies are not intended as recipes for exact replication at other libraries. Rather, they can offer guidance, encouragement, inspiration, and a model of success for those working to bring applications of UDL's principles to life in different circumstances. Hopefully, they will demonstrate how manageable and impactful this work can be and will serve as the catalyst for a whole host of new applications of UDL in libraries of all types.

UNIVERSAL DESIGN FOR LEARNING AT THE WALTER W. STIERN LIBRARY¹

California State University, Bakersfield is a public university in California that has over 11,000 enrolled students.² As is the case at many academic libraries, the Walter W. Stiern Library that serves the campus seeks to offer equitable and inclusive services to all members of the campus community. As their official policies note, “The Walter W. Stiern Library is committed to offering all users, including individuals with disabilities equal access to Library programs, services and collections.”³ This focus on access is supported by the institution’s IT department, which also has a strong commitment to accessibility and provides online training materials to help ensure that all members of the community understand how to make accessible and usable content. In fact, the commitment extends to the entire California State University system, as evidenced by the CSU Accessible Technology Initiative, which supports faculty and staff in making their work more accessible and universally designed.⁴

This institution-wide commitment to inclusion and the regular training programs that go with it have helped to foster an interest in accessibility and UDL among the librarians. For Ying Zhong, Web Services Librarian at the library, this has translated into applying the principles of UDL to inform both her library instruction work and her work maintaining and improving the library’s web presence. In both these aspects of her job duties, she has worked to ensure that all content not only meets the legal standards for accessibility, but also is usable for all members of the community no matter what their needs may be.

In her role providing bibliographic instruction while embedded in a credit-bearing course entitled English 110: Writing and Research, Zhong applied the principles of UDL to all aspects of her teaching. This initially began with efforts to ensure that all documents uploaded to the course site in Blackboard were fully accessible. As is often the case, this started by testing to confirm that these materials met minimal accessibility requirements. Each document was tested to verify that the features were accessible, a process that Zhong notes has only become easier over time as an increasing number of tools, including Microsoft Word and PowerPoint as well as Adobe PDF, have built-in accessibility testing features. Included within this review were elements related to navigation with assistive devices, such as headers and the proper display of tabular information, but the process also included the review of other formatting elements, such as a verification that the fonts were chosen for legibility. This served as a vital stepping-stone to the wholesale adoption of UDL in her instruction work as it ensured that students could navigate

through the materials through multiple different means, including when using assistive devices. It also ensured that the instruction sessions had a strong foundation of content that was clearly formatted and presented in ways that would guide students through the materials. While not sufficient to offer a completely accessible experience for all, this was a vital first step on the path toward adoption of the principles of UDL.

Zhong went beyond documents in designing her teaching materials. To offer multiple means of perception, she incorporated videos and images into her instructional content as appropriate.⁵ For all multimedia content used in her teaching, she created the necessary text equivalents to facilitate access, such as captions or transcripts for videos and alternative text for images. Featuring multimedia content helps to reach students who find this material easier to comprehend and also helps to ensure that students have the ability to go back and review the content in visual format outside of the lecture itself. To integrate physical activity into the lesson for those learners who connect most with movement, Zhong included an exercise that got students out of their seats to participate in a living embodiment of the Boolean logic concepts she was teaching. To offer a participatory demonstration of the Boolean concept of AND, OR, and NOT, for example, she “would ask the students who are wearing glasses ‘AND’ T-shirts to stand up.”⁶ This helps students to learn the concept through kinesthetic learning and offers a clear memory to which they can tie the concept when later applying what they have learned. In addition, she integrated multiple ways for students to use and demonstrate their understanding of the topic. Students were given a mix of assignments that ranged from written homework to collaborative projects that resulted in group presentations to the entire class. This mix of approaches ensures that everyone will be able to find a way to meaningfully demonstrate their understanding of the topic and prepare to use the skills in their own work.

By designing a teaching approach that integrated each of the principles of UDL, Zhong found that she created a learning experience that students preferred as well as one that was better designed to reach more students. Through survey questions, she learned that a “majority of students reported benefiting from UDL-integrated instruction.”⁷ Moreover, the survey found that “students repeatedly reported hands-on exercises or learning by doing as the most effective method,”⁸ which demonstrated the value of incorporating these elements into the teaching methods. By applying UDL principles to the design of this series of instructional sessions, Zhong was able to engage students in ways that they found more effective and engaging while simultaneously offering an experience that was accessible to those students who may use assistive technology from the very beginning.

Though the library now has a library instruction coordinator who is responsible for creating instructional materials and tutorials, the commitment to accessibility and usability for all students continues to be important. For example, the library maintains a number of tutorials that guide students through various topics ranging from choosing a research topic to logical reasoning, which provide multiple ways for students to engage with information literacy topics. Video tutorials integrate captions to offer multiple means of perception. The tutorial program as a whole incorporates assessment activities that help students to actively try the material being taught and get feedback on their progress. As a whole, this approach creates information literacy instruction that is accessible and usable for the full range of students that are enrolled in CSU Bakersfield.

In addition to applying the principles of UDL to her instruction work, Zhong also uses it as a lens through which to consider her work on the library's web presence. Every time content is added to the website, she monitors it for accessibility and conformance with the principles of UDL to ensure that it will be usable by all from the very beginning rather than requiring later remediation. In addition, the workflows for maintaining accessibility of the website are designed to prevent problems from arising, including weekly review by an automated testing tool that identifies any new issues for immediate resolution. She has found that focusing on applying the principles of UDL has not only improved her library instruction sessions, but has improved the library's entire web presence, making it more inclusive and usable for all users.

Though this work has been ongoing for many years, it paid particular dividends in 2020 as the COVID-19 pandemic forced campus classes to move online. The library was in a strong position because their online content and teaching materials had already been created to be not only compliant with the minimum requirements of the ADA, but also designed to conform to the principles of UDL. As Zhong noted, this allowed them to be sure that all of their content was ready to "be used by all of the users regardless of their capability." This greater level of confidence that their online content was accessible and usable for all helped them to serve their patrons successfully at a difficult time without the need to go back and make time-consuming changes and improvements to offer online access to all.

Even separately from the pandemic, Zhong found that applying the principles of UDL has served the library well. As she put it, "UDL will help you to think thoroughly through your teaching and the delivery of your content." Moreover, it is a structure that ensures that inclusion is being done correctly from the very beginning of projects. This prevents patrons from encountering barriers and issues, which she has found means that patrons do not raise com-

plaints or concerns. Though Zhong acknowledges that some faculty initially raised concerns that applying UDL to their own work would require additional training or slow their progress, she has found that the time spent was worth it and ultimately it did not slow her work. For those considering this work, she points out that tools are always improving to support this work and make it more efficient. Ultimately, the work is worthwhile even when it does require new workflows and investing additional time because it improves the outcomes for both the library and the patrons.

INCLUSIVE SERVICES AT BROOKLYN PUBLIC LIBRARY⁹

The Brooklyn Public Library (BPL) is the sixth-largest public library in the United States¹⁰ and serves Brooklyn, the most populous borough in New York City.¹¹ Inclusive Services at BPL is, as the name suggests, designed with inclusion as a core piece of its mission. As their homepage phrases it, “Fostering an inclusive environment, we open our doors to all children, parents, caregivers and educators.”¹² They serve a wide population from young children to teens to the parents and caregivers of those children. All of their programs are designed to be equally welcoming for patrons with and without disabilities. For this reason, the principles of UDL are a high priority in all of their work. As Carrie Banks, Supervising Librarian for Inclusive Services, notes, “Every project we do, we apply these principles. That’s what our whole service is.” She feels strongly that integrating these principles at the early stages of all of their work has “allowed us to serve 18,000 children and teens with disabilities and their families last year. . . . [It also] allows you to build lifelong support. We want people to continue to use the library as they age.” Applying the principles of UDL broadly across their work has helped Inclusive Services, and by extension the Brooklyn Public Library, to develop a reputation for inclusion and support for their patrons and community.

The process that they have adopted considers the principles of UDL from the earliest stages of design for all of their work. This means that all of their program design efforts focus on inclusion from the start rather than retrofitting the program after the fact to be more inclusive or to respond to accommodation requests. Banks also notes that this is a part of the reason UDL can be so impactful: “We have a tendency to want to adapt what we are doing. . . . That’s really not a good thing. We need to be designing them inclusively in the first place . . . so that it is a normal part of the program. That’s the advantage of Universal Design for Learning. . . . It is also a whole lot less work than going back through and adapting the program or service after the fact—and cheaper.” This means that no matter what new offering Inclusive Services is

creating, they will apply the principles of UDL throughout the design stage to maximize inclusivity and improve the overall patron experience.

In particular, when they are planning a new program, they focus closely on the UDL framework. Intentionally adding elements that fit as many of the principles as possible given the subject of the event ensures that nothing is overlooked and helps to minimize the need for accommodations later in the process. As an example, Banks has written in the past about how UDL has influenced lesson planning about gardening at the Brooklyn Public Library, which combined reading, discussion, movement, manipulation, and reflection and was offered in both Spanish and English to serve the local community.¹³ Through this approach, they ensure that they are not just making the programs accessible to disabled patrons, but they are also making the programs exciting, engaging, enjoyable, and educational for all of their patrons regardless of their needs, interests, or preferences. It is a way of designing programming that will not just allow all patrons to participate, but will also make them feel welcome and will authentically engage their interest and teach them new information.

This approach to design had a particularly significant impact in the case of their Universal Makerspace programming. Using the principles of UDL, they designed a curriculum for the Universal Makerspace programs that could not just allow individuals with disabilities and other varying needs to attend the sessions but also actively and equitably participate in the sessions. The target audience for these programs was teenage patrons, and the programs were designed to appeal to their interests and abilities. Each program integrated a mix of activities that included demonstrations and presentations to offer background on the topic, handouts that enabled participants to see and read information for themselves, and hands-on activities for them to put the concept they were learning into practice through active creation and manipulation of materials. For example, in a session on sound, they created model eardrums using plastic wrap to understand how sound waves work. By offering so many different approaches to the topic, the content was broad enough to engage different interests, appeal to varied skills, and allow patrons to put what they were learning into actual practice.

Each Universal Makerspace session was structured to engage the widest possible group of patrons. One exemplary session was focused on anatomy and dissection. The goal was to offer a dissection experience that could be accessible, inclusive, and educational for all participants, but achieving this required careful consideration and the adoption of targeted technology. To start with, participants needed to have common background information, so the necessary information and charts were shared both in a PowerPoint presentation and as handouts next to each participant. In this case, the tactile

element of the session was actually dissecting cow hearts and squids using dissection kits made from pumpkin carving kits. To make this inclusive for all regardless of their ability or desire to dissect an actual item, the library identified and offered an app that allowed users to conduct a virtual dissection with the swipe of a finger. Each person was given the option to use the virtual app regardless of ability so that there was no need for disabled patrons to self-identify as disabled and so that patrons who were simply uncomfortable with the idea of dissecting an actual squid or heart could comfortably opt out. In addition, participants worked in pairs to foster collaboration and peer support. However, despite all of this planning, the Inclusive Services team recognized that the program was still not fully inclusive at this point because the dissection app was not accessible to blind or low-vision users. Because they had evaluated the app with access in mind and recognized this limitation, they were able to provide an alternative access point by having a person on hand to verbally describe each step to patrons who were unable to see the app. To normalize this process, the person in charge of description modeled how to describe content properly in front of the whole group, which also led to some of the participants trying the descriptive process together in their pairs. What initially seemed like a limitation of the design of the program ended up being an additional learning opportunity for all participants as well as a means of making the program welcoming for all patrons.

An important part of Brooklyn Public Library's work to create an inclusive experience for all is their commitment to gathering feedback from all of their users. To that end, they work hard to involve all parts of their community, including patrons with disabilities. One of the ways that they do this is by hosting a self-advocacy group at the library, which helps them to know what is important to their users with disabilities and offers them an opportunity to ask how the library can serve them better. They have also done focus groups with teens with disabilities about what they would like to see at the library. Through that process, they discovered a strong interest in accessible gaming that grew into an adaptive gaming arcade program that they otherwise may not have considered adding to their programming.

Ultimately, applying UDL to programming can be very rewarding and have significant impacts, fostering a type of inclusion that is often overlooked or even incorrectly seen as impossible. As Banks points out, "Real inclusion means not only having people in the room but having them interact with each other. . . . That's what happens when we have physical accessibility but not programmatic accessibility or accessibility of our collections." All too often, libraries focus on physical accessibility at the expense of other types of accessibility, in many cases because they feel less certain how to approach accessibility for programming. As these case studies demonstrate, however, UDL

is a framework that can make these other aspects of inclusion much more approachable. It is often even possible to save money and build participation along the way.

INTEGRATING UDL INTO THE LIBRARY CURRICULUM AT CALVERT COUNTY PUBLIC SCHOOLS¹⁴

The Calvert County Public Schools are located in Maryland, just outside of Washington, DC. The school system serves just under 16,000 students and has four high schools, six middle schools, twelve elementary schools, one career & technology academy, and one special education center.¹⁵ The school library program boasts twenty-two certified school librarians and is an important part of their educational community. The entire school district has made a focused effort to apply the principles of UDL to all of their work for the last several years, which has translated into a number of different initiatives, including a district-wide Universal Design for Learning committee. The committee includes librarians and other educators. Its work helps to ensure that the principles of UDL are applied across the curriculum and in all relevant departments. It offers support for educators who are applying these principles across disciplines, and it creates an opportunity for the librarians to share their expertise in this area with others across the district.

Jennifer Sturge, Specialist for School Libraries and Digital Learning in the district, is responsible for both overseeing the district's school library program and working with the digital learning team by supporting technology integration in two middle schools, a high school, and the special education center. She integrates UDL throughout multiple aspects of her work, and it is an important topic across her district. As she notes, "As we build curriculum, lessons, and integrate technology into the library and the classroom, we are thoughtful to think about accessibility and UDL in our building of materials." This widespread focus on the principles of UDL has offered many opportunities for both the library and other areas of the district to offer more inclusive and effective educational opportunities for students.

In the district libraries, they have found many opportunities to consider their work in new ways through the lens of the principles of UDL. There is an overall philosophy of putting access and support for all users at the forefront of their work. Fostering this approach district-wide from the very beginning can offer many benefits. Sturge said, "When you start from the ground up building a lesson or a unit or curriculum with UDL in mind, you have less to go back and re-create or refine later. Because we apply multiple points of entry, different ways to access and synthesize, we feel like we are better able

to meet the needs of our students—it’s a win, win all around.” This work is equally beneficial in all areas of the curriculum and, as Sturge wrote in a recent article in *Knowledge Quest*, it has only become more valuable as classes started being offered remotely during the COVID-19 pandemic.¹⁶

One noteworthy example of this is that UDL has impacted how they develop their collections and acquire materials. Knowing how important multiple means of engagement and representation are, they have made it a priority to not simply purchase print materials but to be focused on developing a collection that has multiple ways for students to access the information. Sturge highlighted that “we try to get our books in print, ebook format, and audio format in order to support reading and literacy for as many students as possible.” This offers students multiple ways to engage with information and more equitable access by offering the same books in multiple formats. It also helps students to find a way to engage with the information that they will find enjoyable, thus facilitating a love of reading for a wider range of readers. This is one aspect of UDL that can apply to all libraries as this focus on offering the same work in multiple formats can be a vital way to engage those who may not consider themselves readers and, through this approach, create lifelong readers and library users. These school libraries have found success by integrating these considerations into their collection development, but this is an approach that can be equally effective at all libraries and with patrons of all ages.

The commitment to access carries over to materials that they create as well. The principles of UDL guide Sturge and the other librarians as they design and share materials with students, including being “very cognizant of the need to build [these] materials to work with adaptive equipment such as screen readers.” To facilitate this, they use Springshare’s LibGuides platform, which offers a lot of support for accessible design, and have worked to ensure that all of their guides meet all accessibility standards. This offers certainty that students using assistive devices will have equitable access to these materials as required by law and the principles of UDL. Beyond assistive devices, this platform also allows information to be clearly and predictably structured and organized, which can be key factors in ensuring that all users can effectively access and navigate through the information independently.

After a redesign process that started about three years ago, their entire elementary library curriculum has been rewritten to focus on the American Association of School Librarians (AASL) Standards Framework for Learners.¹⁷ During this process, they were thoughtful about how to ensure that they not only fit closely to the AASL standards, but also applied the principles of UDL to this work. As Sturge notes, “All of our lessons focus on the AASL shared foundations—one of which is INCLUDE—so as we wrote the

curriculum, we were cognizant to include materials, options, and ideas that could meet the needs of every kind of learner.” Another example of this synergy is the natural fit between the Curate and Engage Shared Foundations and UDL’s emphasis on offering students options that include multiple means of representation.¹⁸ By helping students to understand how resources of multiple media, formats, and styles might fit into these processes, school librarians can simultaneously respond to the guidance of this Shared Foundation and the multiple means of representation principle of UDL. This meant that their overall approach to the redesign process centered inclusion at all points.

Fortunately, the AASL Standards Framework for Learners offers many opportunities to integrate the principles of UDL into school library curricula. One key aspect of this is UDL’s emphasis on student choice and supporting students to become independent, self-regulated learners who can develop their own goals and strategies for reaching those goals. As Sturge points out, the AASL Shared Foundation Explore focuses on students who “are discovering and innovating in a growth mindset, they are reading widely and deeply in multiple formats and engaging in an inquiry-based process for personal growth. These actions allow students options for how they learn and provide them with choice in order to persist and self-regulate.”¹⁹ In the Calvert County Public School libraries, they work to integrate these complementary goals with one another. To do this, Sturge explains that “We incorporate choice boards into much of our work—allowing students to decide what is going to work for them. We also think about goal setting and working on bringing a sense of ownership to the library by allowing students to pursue research on self-selected topics.” During the period of remote work during the COVID-19 pandemic, they have continued to focus on offering real independence for students by “provid[ing] multiple databases and pathfinders for student use and engag[ing] students with meaningful choices.”²⁰ This helps students to develop their own independent scholarly approaches and teaches them how to determine what works best for them while keeping them engaged and focused on their goals.

Though it has clear benefits, designing materials pursuant to the principles of UDL can be a formidable undertaking. Sturge concedes that one of the disadvantages of this approach is the time it can take: “It’s not an easy task to think through everything that you want to include or should include and sometimes I feel like we are really slow at getting things together because we have to be so thoughtful about it.” However, this time spent up front can help to streamline later aspects of the instructional design. For example, while applying UDL will not completely eliminate the need to offer accommodations for students with disabilities, if the principles are applied in a thoughtful manner they can reduce the number of accommodations required by creating an

environment that is equitable and inclusive from the beginning. This means that, while the design phase may take longer, overall the process is more efficient and effective for the librarians and students.

RACE PROJECT KC BY THE JOHNSON COUNTY LIBRARY²¹

When the Johnson County Library in Kansas City organized an event with author Tanner Colby, no one could have anticipated what a lasting impact it would have. Colby was speaking about his book, *Some of My Best Friends Are Black: The Strange Story of Integration in America*, which dives into discriminatory housing policies that helped perpetuate segregation for many years in Kansas City. Angel Jewel Tucker, Youth Services Manager at the library, notes that “he was really unearthing some fascinating truths about our community” and, though a significant segment of the book focused on Kansas City, these were issues that often touched on matters that were having nationwide impacts. As Tucker says, in “our library at the time, we knew the book was going to be an important book in our community,” so they went further than simply hosting a single library program. They also designed a series of events on the theme of race in Kansas City that involved local artists, authors, playwrights, educators, and more. They also took Colby to a local high school and community college for discussions that demonstrated how interested students were in engaging on these topics.

The entire program was such a rousing success that it inspired the idea of expanding this into an effort that outlasted a single author visit. To achieve this goal, the library brought together “educators from every school district the following summer and they talked about their struggles. They wanted their kids to have this information but didn’t know how to talk about it.” Starting the conversation at this event for educators led two schools to approach Tucker and her colleagues about curating a way for the students to experience this element of local history. This grew into the Race Project KC, which is “an annual immersive social justice initiative focused on the role of racism in the history of the United States and, more specifically, the Kansas City area. It is designed for students in grades 9 through 12 in the KC metro area.”²² Initially, the program consisted primarily of a bus tour of local landmarks pertaining to segregation that brought together students from two area schools that generally would never have a chance to interact with each other. Students on the tour had an opportunity to see historical sites while reading about them in a guide book created for the program that highlighted key elements of the history and provided discussion questions to guide conversations between the students on the bus and in the follow-up event after the tour.

Over time, the program expanded and developed to integrate many additional elements and increase the access points and available choices for students to better support authentic engagement and personal choice. The program now involves three to four cohorts each year with three to four schools participating in each cohort. Each cohort participates in three workshops together, with one of these including the bus tour and another one being hosted by a local museum. These offer a variety of ways for students to interact with the historical record and with each other. The workshops offer a range of approaches to the material from discussions to art-making to presentations.²³ The program also now culminates in an annual symposium. Every year the program brings in one or more authors for the students to interact with and learn from in small group settings. Tanner Colby has continued to participate in the program after the first year when his book served as the spark for the idea, and they have also hosted Ta-Nehisi Coates, Nathan Louis Jackson, and Jacqueline Woodson,²⁴ to name just a few of the illustrious authors and artists who have participated in the program.

From its initial design, the program aligned with many of the principles of Universal Design for Learning, offering multiple means of representation and opportunities for the students to actively participate at several points and integrating additional elements that aligned with UDL principles over time. Despite this natural alignment, UDL was not a conscious element of the project at this point. Instead, Tucker found that “naturally we created something that aligned so perfectly” with UDL principles due to their experience working with teens. In particular, she found that her experience as a youth services librarian gave her an instinctive sense of how to integrate varied elements into the program to appeal to many learners. Elements that appealed to different interests, learning approaches, and strengths were built in from the first iteration of the program to engage all students effectively and help them to embrace the program.

However, over time, the approach to UDL was integrated into the design for growing the program more intentionally. A major piece of this has been building in more avenues for choice for the students. The annual symposium now prioritizes student choice so that activities are aligned with students’ interests and strengths. In addition, they continue to integrate more ways for students to take active roles in the process. Students have taken an active role in creating a game on the topics covered in the program, which allows students to express their learning while also offering a new way for subsequent students to engage with this information in the future. Students have also taken the lead on more of the work. Whereas librarians used to take on tasks such as introducing the authors, they have focused on delegating as much of this work as possible to the students so that they can take ownership of the

program, demonstrate and act on their learning, and develop new skills. As Tucker describes it, “As librarians, we want to be the people who are curating the experiences instead of leading the experiences,” to offer students an opportunity to take control of their learning experience and actively apply what they are learning at every turn.

At times, this focus on providing options for actively expressing their knowledge means extending the students’ work beyond the bounds of the program’s typical activities. For example, after the 2019 program, students had the opportunity to work with the local Nelson-Atkins Museum of Art to participate in curating content for, and even having a presence at, the *30 Americans* exhibit, which featured art by thirty African American artists.²⁵ This built on the museum’s existing involvement in the program to offer new ways for students to continue the work after the program’s end and do outreach to others in their community. In the coming year, the program is poised to take a further step toward community impact through a \$10,000 grant that will allow them to cultivate and support a small group of student writers who will build their skills on a path to publishing editorials and other pieces that engage with topics related to the history they are studying and its connection to today. All of these elements offer multiple means for students to engage with the subject matter and actively express what they have learned and, as such, the program more directly incorporates elements of UDL effectively.

It has also meant integrating additional ways for students to be independent in engaging with the materials. Based on feedback from both students and teachers about a desire to have greater independence “to be able to take this journey on their own terms,” an audio version of the tour was developed to allow exploration beyond the bus tour. With the onset of the COVID-19 pandemic, it became necessary to expand beyond the bus tour. To do so, they developed a virtual tour that became freely available in March 2021 that allows students and other members of the community to learn about these landmarks and topics even if they are not able to take the tour due to the pandemic. These tours are both excellent examples of the way that representing the information in multiple different media can support learners in absorbing the content through whatever their preferred modality may be.

The program has not been without its challenges. Tucker found that one of the toughest parts of the program has been expanding it to address other identities that students may have. In particular, they have grappled with whether to bring the Latinx experience more directly into the program even though it may be less directly connected to the original topics the program focused on. In part in response to this desire to consider other aspects of identity, they have integrated more options for student choice. In addition, they will also be doing a new workshop this year focusing on health equity, which will offer

an opportunity to expand their lens to include more populations, including Latinx communities. By expanding the program to touch these additional topics, they will be able to engage students in new ways and build new ways for them to express their own feelings and connect them to larger topics in society. This will also help them to address another challenge which is encouraging students to take what they learn and make changes in their communities. Tucker considers this one of the toughest elements to track after the program, but they are also addressing this by building an alumni group to keep in touch as students move on, go to college and out in their communities, and have a real impact in Kansas City and beyond.

The program is an excellent example of the way that UDL builds on many of the approaches that librarians already use to engage with patrons. Though UDL was not initially an explicit framework for the work, it so naturally aligned that it ultimately had much of the same impact. As time went on, the team was able to build on this initial intuitive use of the principles to expressly integrate the principles of UDL into the iterative process for improving and expanding the program. Rather than being a technical and complicated set of new ideals, UDL builds on what many librarians naturally understand to be the elements of successful educational experiences. Moreover, this strong, albeit unintentional, foundation made it possible to expand the program to incorporate additional elements that brought the principles of UDL even more to the fore. It demonstrates the way that elements in support of the principles of UDL can be added even to existing programming to expand its impact and ensure that it is inclusive.

CONCLUSION

Each of these projects demonstrates a different way that UDL can contribute to the educational mission of libraries. The form that this work takes is very different in each unique setting. The ways that public libraries will apply these principles can be quite different from the ways these principles influence the work done in academic libraries. However, these examples demonstrate that even in disparate settings UDL can have a meaningful impact on librarians' ability to achieve their educational goals. UDL can also be an area of expertise that allows librarians to contribute to larger institutional goals and initiatives as well. Even if these projects cannot be duplicated in new settings, they can serve as models for the application of these principles in innovative and exciting ways in other library settings. These case studies demonstrate the value of this work and can be useful inspiration for those who are just starting to apply the principles of UDL to their own work.

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Chapter Thirteen

A Checklist for Applying Universal Design for Learning in Libraries

These questions provide guidance to streamline the application of Universal Design for Learning in common library settings. Answering them can help evaluate projects, educational programming, and collections to ensure that they are inclusive and welcoming and meet the standards of Universal Design for Learning. Not all of these questions are applicable to all projects, and other questions may be relevant in specific situations. The checklist should be used as a starting place and a tool to be modified for the specific needs of individual projects.

MULTIPLE MEANS OF ENGAGEMENT

- Is programming offered for those at multiple skill levels?
- Does the programming support patrons in selecting the appropriate skill level for their needs, either through program descriptions or consultations?
- Is programming available on a variety of topics?
- Are learning objectives clear for all programming?
- Are participants encouraged to develop personalized goals?
- Is input solicited from the community when developing programming topics and establishing the skill levels for which programming is offered?
- Are students offered multiple ways to keep informed and engaged before, during, and after classes (i.e., calendars, message boards, direct email contact with instructors)?
- Where possible, do programs allow for choice (i.e., choosing between multiple activities, customizing projects, personalizing goals)?
- Do programs include a clear explanation of how the topics covered can be applied in other settings?

- Are there options for both collaboration and solo work?
- Are there options for learners to “succeed” in different ways?
- Does the content contemplate how to address “failure” with respect to objectives and/or goals in a meaningful and constructive manner?
- Is time offered for reflection at the end of programs?
- Is feedback collected after programs and incorporated into future program and event planning?
- Does the library’s collection development policy support multiple means of engagement by collecting works on diverse topics and by creators representing a wide array of cultures, backgrounds, communities, and experiences?

MULTIPLE MEANS OF REPRESENTATION

- Are outreach materials offered in multiple formats (i.e., physical copies, digital copies)?
- Are event materials, instructional content, or other library-created content offered in multiple formats (i.e., physical copies, digital copies, video content, etc.)?
- Is video content captioned and audio described, as necessary?
- Is audio content transcribed?
- When using graphics, slides, or images in programs, is the content also offered in other formats, including accessible formats?
- Does the library’s collection development policy support collecting in multiple formats (i.e., audiobooks, Braille, large print, ebooks, video content, etc.)?
- Are items that can help clarify terms and translate materials (i.e., dictionaries, language learning tools, etc.) highlighted and showcased?
- Do all written materials include appropriate scaffolding and/or avoid the use of
 - complicated language,
 - symbols,
 - difficult syntax, and
 - complex structure?
- Is content created by the library illustrated with multimedia content?
- Are the key points of educational content or outreach materials highlighted?

MULTIPLE MEANS OF ACTION & EXPRESSION

- Are library programs designed to support attendance and full participation by individuals who use assistive tools and technologies?

- Do the promotional materials make it clear that patrons who use assistive tools and technologies will be able to participate in programming?
- Is physical activity incorporated into programming, where appropriate?
- Are multiple ways to participate and respond (e.g., both raising a hand and submitting a question in writing during a Q&A period) offered?
- Are there options for practicing and building on the skills learned, where appropriate?
- Is programming offered to help patrons develop skills in planning, information management, goal-setting, and progress tracking?

As with the checklist found in chapter 7, this checklist can be used in several different ways depending on the exact needs of individual libraries. In some institutions, it may make sense to develop modified checklists for different departments or distinct types of educational content. In others, it may be advantageous to annually review the existing content to see if it is still achieving the institution's goals with respect to UDL. The important element is to use these questions to ensure that UDL remains at the forefront of the design process from the beginning of a project to the end and even into the phase of ongoing maintenance and revision.

Learning objectives (whether stated or unstated) and educational content are embedded in much of the core work done by libraries, so it is also worthwhile to cast a wide net when deciding where to apply Universal Design for Learning principles. While it is common to hear about UDL in the context of course content in the K–12 or higher education setting, these principles can apply broadly and, as such, so can the questions in this checklist. It can be best, particularly while UDL concepts are new to the team, to use this checklist or a customized version on a wide range of projects rather than limiting its application to a very narrow definition of education or learning.

Chapter Fourteen

Conclusion

How Universal Design Leads to Inclusion

Looking to the future, it is clear that the importance of inclusion will only grow over time. Worldwide, approximately 15 percent of the population, or about one billion people, have some type of disability.¹ In the United States, this percentage is actually higher, with the Census Bureau estimating that 27.2 percent of the country's population has at least one disability.² This translates to a total of over eighty-five million adults in the United States who live with one or more disabilities.³ Among people over the age of sixty-five, two out of every five individuals are disabled,⁴ and this jumps to approximately one out of every two individuals or half of the population over the age of seventy-five.⁵ As populations continue to grow and medical advances support a greater number of people with disabilities, this number is anticipated to increase even further.⁶ Clearly, individuals with disabilities are already an important segment of the population and will only increase as a percentage of the communities libraries serve over time.

This demographic is hardly the only one undergoing significant changes, particularly in the United States. At the same time, the population is aging, which will also contribute to a greater number of people with needs that are currently underserved by the way libraries design their offerings. The number of people over age sixty around the globe has more than doubled since 1980, and this aging trend is expected to continue, with the United Nations stating that worldwide "the number of persons aged eighty years or over is projected to increase more than threefold between 2017 and 2050, rising from 137 million to 425 million."⁷ In the United States, those over the age of sixty-five represent the fastest-growing age-group, having grown by over one third in the last decade.⁸ The demographics of the country are changing in other ways as well. Recent polling suggests that approximately 4.5 percent of the population identify as lesbian, gay, bisexual, or transgender.⁹ Gen Z is

the most ethnically and racially diverse generation ever in the United States,¹⁰ and over 21 percent of the country speaks a language other than English at home.¹¹ Moreover, even with recent changes to immigration policies in the United States, immigrants make up a noteworthy portion of the population.¹² All of this data shows that the demographics of the United States, and much of the world, are changing rapidly in ways that demonstrate the importance of inclusivity and further dispel the myth of the “average” user being representative of our communities.

THE PROMISE OF UNIVERSAL DESIGN IN LIBRARIES

These demographic changes also point to the ways that libraries need to continue to evolve to meet the needs of their communities. To remain relevant when serving such a diverse group of people with widely varied needs, libraries will need to focus on the type of flexibility, equity, and attention to user experience at the heart of Universal Design. Without this focus on continual improvement to meet the needs of changing communities, libraries will face eroding user numbers. As Gail M. Staines points out, “What we design and create needs to resonate with our users so that they return again and again.”¹³ This necessitates an approach to library design projects that takes these changing aspects of the population into account when deciding what and how to design for the library so that users feel welcome and want to use the library. Those designing spaces, products, services, and more for libraries must remain aware of and responsive to the ways that the communities of users continue to change.

More than merely addressing these practical considerations, offering an inclusive and welcoming experience for all users is simply the right thing to do. These numbers may be impressive and put this work in a more stark context, but the change in demographics is not the true reason that inclusivity is important. It is vital for libraries and other public accommodations to serve all users equitably, regardless of needs, because this is the only way to ensure that all individuals have equal opportunities and no user is isolated or excluded from full participation in the community. Anything short of that is failing to live up to the ethos and principles of a library for the benefit of our communities. A recent essay by s. e. smith about the vast gap that can occur between accessibility and inclusion asked the following:

What if accommodation is inclusion, and making people welcome? What if accommodation is acknowledging that everyone, regardless of disability status or need, has a right to participate in public life? That needs are not necessarily linked to disabilities, which may vary over time, and accommodating them

builds a better culture for everyone? What if, instead of fixating on the things people cannot do and grudgingly working around them, we rejoice in diverse experience, in making space for one another, in kindness, in care? In the ways our knowledge of our bodies and lived experience inform our articulation of our needs?¹⁴

While Universal Design and UDL may not be sufficient to ensure that these questions are fully answered in favor of true inclusion, a thoughtful application of their principles can serve as a starting point for this work. They can move the world closer to inclusion for everyone who has previously barely been able to make due with accommodations.

In fact, creating environments that can serve anyone ultimately improves the experience for everyone, not just users who have been seen in the past as having “special needs.” Jay T. Dolmage has summed this up well, stating, “Many of the negative effects of disability can be created by cultural and even spatial constructions—the world is built to accommodate the ‘normal’ body and mind, and we all experience some degree of discomfort due to these limits. These limits also function to make the world highly inaccessible to people with disabilities—or to make them come in the back door.”¹⁵ While this focuses specifically on the impact the physical environment has on those with disabilities, the same could easily be said for those perceived as outside of the “normal” for any other reason. The principles of Universal Design can be helpful in moving away from this conception of design and service provision and toward an understanding that every user’s needs and preferences are unique and worthy of thoughtful consideration during the design phase of all types of projects.

Libraries tend to think of themselves as community spaces that are open to all, but it is not always clear that the definition of community truly encompasses everyone that it could. Through a combination of factors, which can include a lack of appropriate awareness and consideration, libraries around the world unfortunately are spaces that are unwelcoming or inaccessible to far too many people. While we as a profession have not always lived up to the ALA Code of Ethics, it exhorts us to “provide the highest level of service to all library users through appropriate and usefully organized resources; equitable service policies; equitable access; and accurate, unbiased, and courteous responses to all requests” and to “treat co-workers and other colleagues with respect, fairness, and good faith, and advocate conditions of employment that safeguard the rights and welfare of all employees of our institutions,”¹⁶ and these are ideals that we should all strive for. We must look critically at our libraries—including our spaces, services, collections, and more—and be honest about where we are excluding people from our communities as both patrons and employees.

As budgets for many libraries continue to decline and technology continues to rapidly develop, libraries must confront the challenge of how they will continue to serve all members of their communities. Unfortunately, marginalized populations are too frequently left out of this consideration and conversation. When it comes to making tough choices, libraries too often sacrifice the needs of some members of their community in an effort to serve the “average” user. Often this is due to a lack of consideration of the full range of needs and preferences present in the community. A deep commitment to applying the principles of Universal Design, not simply as a checklist, but as a representation of a more significant move toward equitable service provision, can help to ensure that when these choices are made, people are not left out. It can ensure that as new technologies are adopted, libraries are advocating for accessibility and inclusion in their development and are budgeting for implementations that focus on equitable access to these new technologies in their spaces.

Adopting an ongoing commitment to Universal Design is only one piece of building a culture of inclusion at any institution. It must be paired with a larger commitment to understanding and involving the entire community that the library serves to ensure that everyone’s voice is heard and no one is excluded due to systematic choices that ignore their needs. As described above, the principles of Universal Design can be useful in designing and evaluating all aspects of the library experience for the full range of potential users. As Dolmage has noted, “Universal Design is not about buildings, it is about building—building community, building better pedagogy, building opportunities for agency.”¹⁷ As such, it cannot be relegated to the bottom of the checklist of priorities, nor can it be an afterthought that is only considered when seeking to retrofit spaces and products after a complaint has been submitted. Instead, it should serve as a core concept that informs decisions and design processes at all levels.

THE FUTURE OF UNIVERSAL DESIGN

At the same time that there are opportunities for growth and improvement in libraries through the application of Universal Design, there are also opportunities for the concept of Universal Design itself to continue to mature. Though this concept has been growing in popularity and has expanded to encompass new areas as with the development of the Universal Design for Learning framework, there are still gaps in the way that it is typically applied and occasions for critically reconsidering what it has to offer. As discussed in chapters 4 and 10, there are valid concerns about both Universal Design and UDL that those who choose to apply these principles must be vigilant about

considering and addressing. The future of Universal Design and UDL is continuing to evolve in ways that address these criticisms and work to find ways to ensure that the principles ensure access and inclusion for all. It is important that the application of Universal Design avoids a single-minded focus on issues related to disability to the exclusion of all other considerations, while at the same time ensuring that the needs of users with disabilities are not ignored or subsumed. This may be a difficult path to navigate, but it is necessary for Universal Design and UDL to meet their full potential.

Recent works have explicitly considered how Universal Design and UDL can be applied in ways that understand and address all aspects of each individual user and their intersectional needs, addressing all elements of their identity, such as race, ethnicity, gender expression, sexual orientation, etc. This is a particularly important avenue of development for these principles. The potential to address these needs already exists, but it is too often overlooked. As the application of these principles becomes more widespread, more emphasis must be placed on these aspects of Universal Design to ensure that it has the maximum possible impact and so that meaningful inclusion for all is possible.

Another key aspect of the future of Universal Design is how and when it is applied. Advocates for these principles must work to ensure that they are applied from the ground floor in design projects of all kinds to ensure that they facilitate true inclusivity. Technology design is a perfect example of why this is so important. Though technology is not a necessity for either Universal Design or Universal Design for Learning, as new types of technology emerge, it is one area where the principles can have a meaningful impact, particularly because new technologies frequently touch on all aspects of life from work to education to socialization and beyond. Too often inclusivity is an afterthought as new technologies spring into being. This leaves designers tacking on accessibility features that struggle to achieve more than a modest effect. This can be equally true in other kinds of design projects as well. An important piece of raising awareness of Universal Design in libraries and beyond is to ensure that the principles are applied from the earliest days of design projects to maximize their impact and foster meaningful inclusion.

At its best, Universal Design can offer the tools to design in a way that fosters inclusion by being responsive to each individual's complex sets of needs, preferences, and desires. Libraries can benefit from this promise, but only by adopting the principles of Universal Design in a forward-thinking manner. To do so, these principles must become integral to our design work so that they are naturally incorporated from day one of each new project. Moreover, they must be thought of in new ways that broaden their application to all areas of our work. When applied in this manner, Universal Design offers the tools

needed to rethink how libraries approach design. Through its principles, it can guide libraries to a new, more inclusive creative process that will meet a wide range of needs of both patrons and employees from the very beginning. As such, Universal Design offers libraries a way to create welcoming, accessible, and inclusive experiences for their entire community.

NOTES

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Recommended Resources

These resources offer additional information about Universal Design and Universal Design for Learning, as well as related issues of inclusive and accessible design. Many extend the concepts beyond the realm of libraries to other areas of design, but they still offer insights and inspiration that can be applied in libraries. They are recommended for those interested in learning more about these topics and understanding their background.

BOOKS

Chardin, M., & Novak, K. (2021). *Equity by design: Delivering on the power and promise of UDL*. Corwin Press, Inc. This book provides guidance for how to make connections between Universal Design for Learning and social justice. In addition to offering concrete advice for educators, it incorporates case studies with detailed examples of this work being done in a range of educational settings.

Fritzgerald, A. (2020). *Antiracism and Universal Design for Learning: Building expressways to success*. Success. CAST, Inc. Fritzgerald offers an approach to the application of Universal Design for Learning that focuses on making learning experiences that are antiracist. Though the focus is on K–12 classroom education, the compelling techniques and guidance she offers would be valuable in any educational setting interested in applying the UDL framework.

Hamraie, A. (2017). *Building access: Universal Design and the politics of disability*. 3rd ed. University of Minnesota Press. This critical look at the development of the concept of Universal Design offers a window into not only this important design philosophy but also the history of disability activism

that helped lead to it. It offers readers a more nuanced understanding of how Universal Design emerged against the backdrop of disability activism that challenged previous approaches that focused only on the needs of the “average” person. It also collects an array of archival materials related to disability, design, and more.

Hendren, S. (2020). *What can a body do?: How we meet the built world*. Riverhead Books. In her book on the material world, Hendren asks readers to consider the ways in which all tools are designed to improve physical function, not just those tools that are designed as assistive devices for disabled individuals. The book also examines the way that innovation and new design concepts have emerged from attempts to address the needs of disabled individuals as they move through the world.

Holmes, K. (2018). *Mismatch: How inclusion shapes design*. The MIT Press. Though focused on inclusive design as opposed to Universal Design, many of the examples, ideals, and principles outlined by Holmes also have a clear place in Universal Design work. Of particular interest are the specific examples of exclusionary design that are discussed and the work of a few interesting designers who are trying to create a more inclusive world. This is a good option for those interested in inclusive design for technology and software as well as those interested in the distinction between Universal Design and inclusive design.

Meyer, A., Rose, D., & Gordon, D. (2016). *Universal Design for Learning: Theory and practice*. CAST Inc. Written by the originators of the Universal Design for Learning framework, this volume offers a detailed introduction to the principles and the research that underpins them. With details on the research conducted by Meyer, Rose, and their colleagues at CAST, it is a good resource for those seeking to implement UDL as well as those making the case for wider application of the principles at their institution.

Williamson, B. (2019). *Accessible America: A history of disability and design*. NYU Press. Examining design history from an often overlooked vantage point, this book details how disability has influenced the evolution of design in the United States. It covers the influences of disabled veterans, the disability rights movement, legislation, and more on the development of many aspects of the material world from urban design to industrial design. While not specifically focused on Universal Design, it does offer important context for accessible design more broadly in the United States.

WEBSITES

CAST (<http://www.cast.org/>). CAST is a nonprofit that was founded by several clinicians, including Dr. Anne Meyer and Dr. David Rose, who collabo-

rated on the development of the Universal Design for Learning framework. The nonprofit is currently focused on research about UDL and the development of tools to facilitate its implementation. They offer free professional development programs, resources for those who want to learn more about UDL, and regular updates on their research and projects.

The Center for Universal Design in Education (<https://www.washington.edu/doit/programs/center-universal-design-education/overview>). This site from DO-IT at the University of Washington collects resources on applying Universal Design in a variety of education spaces, including libraries. Structured as a mix of videos, Q&As, case studies, tutorials, and more, the resources are helpful for those getting started applying Universal Design in educational settings of all sorts, from K–12 to higher education. The site is also a useful source for finding answers to specific questions and issues that are encountered when making Universal Design part of the planning process for spaces, curricula, programs, and more.

Centre for Excellence in Universal Design (<http://universaldesign.ie/>). A part of the National Disability Authority of Ireland, the Centre for Excellence in Universal Design offers information about the background, principles, and application of Universal Design in a variety of settings. In addition to educational content on the topic, they also provide practical resources, including examples, case studies, checklists, guidelines, and standards. This is a particularly useful collection of resources for use in training others about the principles of Universal Design. While some of the resources are focused on Ireland, many are generally applicable.

The UDL Guidelines (<http://udlguidelines.cast.org/>). CAST has developed a separate website devoted to the principles of Universal Design for Learning, which can be helpful for educators interested in applying the principles. This site offers extensive support for those interested in UDL, including access to some of the research that has been done on the individual guidelines. Some of the resources have been translated into other languages as well.

UDL on Campus (<http://udloncampus.cast.org/>). This website, also created and supported by CAST, focuses on how the principles of UDL can be applied in higher education settings. It includes resources on applying the principles to course and curriculum design, information on the legal requirements that are relevant in a higher education setting, and ideas for how to make media accessible. Of particular interest to libraries, this site includes advice on making Open Educational Resources using the UDL principles, creating accessible media, and collecting and using VPATs.

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