Accessibility and Universal Design
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Overview and Definition

OXO Good Grips kitchen utensils. Large button light switches. Curb cuts. Mobile-friendly web design. All of these originated in the movement towards accessibility and universal design (UD), and making life easier for more people. Accessibility and UD are two separate, but related, concepts meant to consider the needs of different types of people and users. Accessibility puts an emphasis on supporting users with disabilities, whereas UD is broader, taking into account differences such as users' gender, age, native language, and learning preference, to create a physical or virtual item that can be used by as many people as possible (DO-IT, University of Washington 2015).When used together, accessibility and UD result in inclusive, barrier-free products that also meet legal compliance efforts. Libraries can adopt accessibility and UD guidelines to make services, teaching, and spaces more user-friendly.

Basis for Current Interest

The importance of accessible and universally designed spaces, services, and teaching has increased with the ubiquity of tablets and smartphones, as well as changes to accreditation standards and developments in education research. People who were previously excluded from using services, resources, and spaces due to disabilities are now able to fully engage in learning opportunities due to new technology, laws, and advances in social concern. Technology has made it easier to make spaces, services, and resources accessible and user friendly, but at the same time, it requires service and resource providers to keep up with new technology changes and legal issues.

Strategies in both accessibility and UD have made keeping up with technology and policy changes more feasible for many organizations.

Legal standards often drive accreditation standards, to which many institutions must adhere. In particular, the Americans with Disabilities Act, Higher Education Opportunity Act (HEOA), the Rehabilitation Act (particularly sections 504 and 508), and state laws and regulations drive accessibility and UD techniques and practices. Section 504 requires inclusivity and section 508 addresses accessibility of websites. (deMaine 2014). The standards body for the web, the World Wide Web Consortium (W3C), has issued helpful guidelines for UD that comply with these laws and regulations. Recent lawsuits, such as the edX and Harvard/MIT cases, to enforce these requirements have focused on a lack of closed captioning in online course videos. This situation has led some universities to create accessibility teams that focus on access for students with disabilities (College System of Tennessee, Michigan State University Libraries) to ensure all students can access the same spaces and services. However, while adhering to legal and accreditation standards may become required for many libraries, it is really in the best interest of libraries to adopt these practices on their own. Accessibility and UD can help those with impairments and low reading levels and improves materials overall.

Current Applications in Academic Libraries and Higher Education

Academic libraries and higher education institutions have implemented UD practices to improve webpages, change training, and create or revise courses. Flexibility is the driving force behind each of the three principles of UD in Learning (UDL): representation, engagement, and action and expression. These principles mean that information is presented to students via multiple methods (e.g., auditory, visual, etc.), the students learn via different interactions, and students demonstrate via varied modalities that they have acquired new knowledge. This approach accommodates for a range of learning styles and often, but not always,

uses technology. The idea behind UDL is to increase the flexibility for learners while removing barriers to learning.

Although UD may be new territory for many libraries, there are tools and resources that can help, many created by libraries and institutions that have already implemented these practices. For example, CAST's (Center for Applied Special Technology) UDL on Campus website focuses on UDL in higher education. In addition to a list describing the UDL initiatives at more than 20 colleges and universities, the site provides examples of how faculty in different disciplines might use the UDL framework to redesign their courses. There are also links out to WebAIM (Web Accessibility in Mind), WCAG 2.0 (Web Content Accessibility Guidelines 2.0), Section 508 Accessibility Checklists, and other sites that provide further details about how to create accessible text, images, audio, video, and more. This resource can be a useful tool for libraries that want to begin implementing accessibility and UD in their settings.

Librarians and instructors do not have to do this implementation on their own; there are experts who can help. Many colleges and universities employ instructional designers who guide or consult on developing accessible learning materials. They may work collaboratively with instructors to consider visual, auditory, mobile, and cognitive differences in learners and incorporate different learning modalities. There are a number of ways to make content more accessible, keeping in mind the limitations of some assistive technologies (e.g., screen readers). Instructional designers can be invaluable in transforming a course or a lesson into accessible and universally designed content. Libraries need to consider UD in instruction, services offered, and collection development. Libraries can be both an example of and a resource for implementing UDL in a cost-effective way. There are a number of general practices that can be adapted across the institution and within the library to get started in making services and spaces more accessible and user friendly.

Best practices for text-based documents and communications
- Use fonts that are more legible (e.g., Arial, Calibri, Georgia, Helvetica, Tahoma, Verdana).

- Check color contrast between text and background (tip: use the Color Contrast Checker on the WebAIM site).
- Use active hyperlinks that have descriptive anchor text indicating where the link leads.
- If using mathematical equations, create them using LaTex or an editor (such as MathType) that converts to MathML.
- For tables, use table headers for rows and columns, use captions for table titles, and avoid merged cells.
- When formatting, rather than relying on bold and italics to delineate sections and headers, use formatting tools within text editing applications to create headers, sections, and lists.

These strategies can be adopted across all library departments for both public and internal communications and documents. But when it comes to multimedia, there are additional guidelines to consider.

Best practices for multimedia
- Include captions and transcripts for video and audio, and descriptive alternative text for images.
- Avoid using color alone to convey information; if unavoidable, use a color contrast checker.
- Avoid animations, but if using them, describe them sufficiently.
- Avoid the use of Flash; use HTML 5.0 instead.
- Avoid bright, flashing graphics that may cause photo epileptic seizures.

Applications in Academic Library Instruction

Catalano (2014) used the principles of UD to modify an online library research course so that it would be more accessible. She provided content in multiple formats and allowed students to select the format of their final projects. This adheres to two of the principles of UDL – representation and action and expression. Catalano found that the students with diverse disabilities responded positively to the changes, but believes all learners would benefit from UD.

Chodock and Dolinger (2009) describe many ways they have adapted library instruction at Landmark College, which primarily serves students with learning disabilities or ADHD. These approaches included web-based course guides which increased accessibility for dyslexic and aural learners, printing the searches/terms used during the session in advance, using an agenda, teaching only the skills needed for the assignment, presenting materials in multiple formats, reducing unnecessary repetitions, and allowing extra practice time in class. UD removes barriers to learning and makes learning more flexible for all users.

Webb and Hoover (2015) also followed the principles of UDL when creating [tutorials for a biology lab course](#). The tutorials allowed students to engage with the content in multiple ways, and they found that their students responded positively to these multiple methods for learning.

DeMaine (2014) describes her library's instruction journey from merely providing a textual alternative to providing a fully compliant, universally designed online legal research course. She also discusses how librarians have helped other law professors improve the accessibility of their courses. Her examples range from changing the color contrast on a blogging template used by a professor, providing text equivalents to videos in the same place as the videos, adding visible captions to images, and providing natural breaking points in the materials.

Many libraries have found online instruction to be time consuming to adapt to accessibility and UD standards, but there is support available through various toolkits such as the Association of Research Libraries' [Web Accessibility Toolkit](#), which includes links to its members' resources. The Association of Specialized and Cooperative Library Agencies (ASCLA) also provides a set of tip sheets as part of its ["Library Accessibility –What You Need to Know" toolkit](#) and also offers another [toolkit](#) that encourages libraries to consider accessibility when deciding whether to purchase or subscribe to library resources.

Potential Value

Many people, not just those with disabilities, benefit from accessibility and UD. Designing for accessibility may have been intended to accommodate those with disabilities at first, but the modifications made are often appreciated by those without disabilities because it makes tools and spaces easier to use and allows for greater flexibility. UDL can enhance learning opportunities, allowing students to choose their preferred methods for gaining new knowledge, interacting with it, and demonstrating their comprehension.

Potential Hurdles

There are several hurdles to accessibility and UD. Perhaps most importantly, implementing UD requires significant education and additional time expenditure for librarians. Librarians typically do not have training in either education or UD, and advanced training will need to be provided for librarians to successfully implement these principles.

Librarians may need to collaborate with IT staff to ensure software, hardware, and systems can support accessibility and UD initiatives. Funding bodies and administrators may also need education before they are willing to provide the money and training necessary. Many web tools that librarians already use are not accessible, and librarians may be reluctant to move to a different tool or system that the need to learn. Additionally, new tools and systems can cut into a library's already stretched budget.

Conclusion

Accessibility and UD can provide all users with more equal opportunity learning, potentially making librarian's work more effective and efficient. As more librarians begin to utilize the principles of UD in their instruction, it may become an area in which they can learn from each other and share best practice tips. Some states are requiring accessibility compliance, and taking the time to implement it now will help save time, effort, and stress in the future. But most importantly, these practices will result in better experiences for library users.

Recommended Tools

Accessibility Verifiers
- AChecker: http://achecker.ca/checker
- Amara: https://amara.org/en/ (simulates screen reader)

- Color Contrast Checker: http://webaim.org/resources/contrastchecker
- Color Oracle: http://colororacle.org (color-blindness checker)
- Vischeck: http://www.vischeck.com
- WAVE: http://wave.webaim.org
- Web Accessibility Initiative: https://www.w3.org/WAI/ER/tools/ (more tools)
- WebAim: http://webaim.org/

Universal Design Support Tools
- Dragon: http://www.nuance.com/dragon (transcription software)
- Express Scribe: http://www.nch.com.au/scribe (foot pedal-enabled transcription software)
- MAGpie2: http://ncam.wgbh.org/invent_build /web_multimedia/tools-guidelines /magpie2helpcontents (captioning software)
- MovieCaptioner: http://www.synchrimedia.com
- oTranscribe: http://otranscribe.com
- VoiceThread: http://www.voicethread.com/ (accessible collaboration tool)

References

Catalano, Amy. 2014. "Improving Distance Education for Students with Special Needs: A Qualitative Study of Students' Experiences with an Online Library Research Course." *Journal of Library & Information Services in Distance Learning* 8 (1/2): 17-31. doi:10.1080/1533290X.2014.902416.

Chodock, Ted, and Elizabeth Dolinger. 2009. "Applying Universal Design to Information Literacy: Teaching Students Who Learn Differently at Landmark College." *Reference & User Services Quarterly* 49 (1): 24-32. doi:10.5860/rusq.49n1.24.

deMaine, Susan David. 2014. "From Disability to Usability in Online Instruction." *Law Library Journal* 106 (4): 531-561. http://www.aallnet .org/mm/Publications/llj/LLJ-Archives/Vol-106/no-4/2014-30.pdf.

DO-IT, University of Washington. 2015. "What is the difference between accessible, usable, and universal design?" Last modified August 20. http://www.washington.edu /doit/what-difference-between-accessible-usable-and-universal-design.

Webb, Katy Kavanagh, and Jeanne Hoover. 2015. "Universal Design for Learning (UDL) in the Academic Library: A Methodology for Mapping Multiple Means of Representation in Library Tutorials." *College & Research Libraries* 76 (4): 537-553. doi:10.5860 /crl.76.4.537.

Further Readings

Accessibility @ Rutgers. 2017. "Course Accessibility Guidelines." https://accessibility.rutgers .edu/wp-content/uploads/Rutgers-Course -Accessibility-Guidelines.pdf.

Nall, Clark. 2015. "Academic Libraries and the Principles of Universal Design for Learning: Representation Beyond Courses." *College & Research Libraries News* 76 (7): 374-375. http://crln.acrl.org/content/76/7/374.full.

National Center on Universal Design for Learning. http://www.udlcenter.org/.

Pennsylvania State University. "Accessibility and Usability at Penn State." http://accessibility .psu.edu/.