UD and UDL: PAVING THE WAY TOWARD INCLUSION AND INDEPENDENCE IN THE SCHOOL LIBRARY

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Universal Design (UD) is widely used in architecture. It is evidenced in public and private spaces to ensure environmental access (facilities and equipment) to the broadest range of users. Universal Design for Learning (UDL) is a research-based set of principles that provide a practical framework for using technology to maximize learning opportunities for all students. This article discusses school library applications of UD and UDL: two conduits toward inclusion and independence for students with disabilities.

In the last decade, the 2001 Elementary and Secondary Schools Act ("No Child Left Behind") and the 2004 Individuals with Disabilities Education Improvement Act (IDEA) changed the place for special education and mandated the inclusion of most students with disabilities in general education classrooms, and gave these students access to the general education curriculum. The impact of such inclusion ripples to school libraries, as well. Consequently, the need for school libraries to address the research and information needs of students with disabilities has been heightened.

Importance of the School Library

The school library is a very important learning center. It can dramatically impact learning and instructional delivery for students and teachers alike. Kathryn Blackett and Don A. Klinger's research well documents a positive relationship between school libraries operated by professionals and student achievement (2006). According to a report from Scholastic Library Publishing, research since 1990 clearly demonstrates the importance of school libraries to students' education (2004).

Whether student achievement is measured by standardized reading achievement tests or by global assessments of learning, research suggests "a well-stocked library staffed by a certified library media specialist has a positive impact on student achievement, regardless of the socio-economic or educational levels of the community" (Scholastic 2004). The library complements and expands the classroom. For students with disabilities, the benefits of library use are not only academic but also attitudinal.

The physical environment should be both safe and accessible. This extends from the parking lot to the ability to travel within the library. Signage should be readable. Both size and formats such as Braille must be considered.

Students with disabilities who became comfortable using the library experience an increase in their sense of independence and self-esteem (Murray 1999).

As public facilities under the auspices of the Rehabilitation Act of 1973, Section 504, and Americans with Disabilities Act of 1990, school libraries must provide access and support for students with disabilities. Both acts protect individuals with disabilities against discrimination and exclusion from public programs. In an attempt to ensure access and support, Brigitta Irvall and Gyda Scott Nielsen outline specific guidelines for addressing the needs of persons with disabilities. Guidelines focus on physical access, media formats, and service and communication. Physical access centers on access to library entries, floor plans, materials, and services (2005).

Irvall and Nielsen's guidelines encourage the provision of a range of media formats including traditional resources, electronic and digitized resources (e.g., e-books, talking newspapers, and periodicals) and tactile picture books. The service and communication portion of their guidelines suggests ways to effectively communicate with individuals with disabilities and to demonstrate interest and effort to include students with disabilities in library services and programs.

Universal Design in School Libraries

Universal Design refers to facilities and equipment. According to Sheryl Burgstahler (2008), physical access, media format, and service and communication should be planned in accordance to the principles of UD (see figure i). In libraries, UD refers to enabling access to the facility and its services for the widest number of users, including people with a range of differences (e.g., disabilities, age, reading ability, language, and culture).

Much of UD seems like common sense, although it wasn't too long ago that ramps and elevators were not always available for people to access a building. In recent years, architects have incorporated many of the principles of UD: curb cuts in sidewalks; closed captions on televisions; and use of automatic water faucets, soap dispensers, and toilet flushes. These implementations have become integral parts of daily life in the United States.
The physical environment should be both safe and accessible. This extends from the parking lot to the ability to travel within the library. Signage should be readable. Both size and formats such as Braille must be considered. Lighting is also important, and it must be flexible to meet specific needs of students with disabilities. Telecommunication devices such as TTY/TDD should be in place for individuals who are deaf. Adaptive technologies should be readily available to ensure access to publications and website resources.

When it comes to applying UD in library spaces, the Disabilities, Opportunities, Internetworking, and Technology (DO-IT) organization (headquartered at the University of Washington) has become a leading force. DO-IT uses technology to support the participation of individuals with disabilities toward independence. DO-IT's website <www.washington.edu/doit> provides videos and printed materials that clarify how to make buildings, technology, and instruction accessible through UD.

To enhance the sense of welcome extended by a UD library, the staff is responsible for increasing the comfort of everyone who uses the facility and for communicating effectively with diverse populations—including those of different races, ethnicities, ages, and abilities (Wojahn 2006).

In addition, the extent of personal and technical assistance offered for students who require help reflects the degree to which the library is universally designed. When screen readers are available to read electronic information, or simple magnifying glasses are available to increase the readability of text, the independence and inclusion of a student with a disability grows exponentially. When these technologies and policies are made integral to the library itself, it becomes an incredible venue for both independence and inclusion in learning (Burgstahler 2008).

To enhance the sense of welcome extended by a UD library, the staff is responsible for increasing the comfort of everyone who uses the facility and for communicating effectively with diverse populations—including those of different races, ethnicities, ages, and abilities (Wojahn 2006). The staff is the resource for information about getting around in the library, accessing printed materials, and electronic resources. According to Irvall and Nielsen (2005) libraries can address the needs of individuals with disabilities, differentiating the types of services that would most effectively assist individuals with specific disabilities (see table 1).

Diverse media formats, and hardware and software tools to use the media, are necessary to provide access for students with specific disabilities. A Kurzweil Personal

Table 1. Media formats to provide access for students with specific disabilities.

<table>
<thead>
<tr>
<th>DISABILITY GROUP</th>
<th>Large Print</th>
<th>Tape/DAISY* CD/iPods/iPads</th>
<th>Braille</th>
<th>Website</th>
<th>Videos with subtitles and/or sign language</th>
<th>Text Telephone</th>
<th>Easy to read</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visually Impaired</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Deaf and Hearing Impaired</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Learning Disabilities</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Physical Disabilities</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intellectually Disabled</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Adapted from IFLA Guidelines Access to libraries for persons with disabilities CHECKLIST By Birgitta Irvall and Gyda Skat Nielsen 2005

*DAISY is a Digital Audio Information System—Digital Talking Book
Reader allows students with visual and/or intellectual issues to access digital resources. Headsets enable those with hearing impairments to adjust the audio to an appropriate level without interfering with others using the library. Headsets can also serve to focus the attention of students with learning disabilities.

To comfortably work within the library with all media formats, individuals with physical disabilities require adjustable desktops, which make room for wheelchairs. The same consideration should be given to the width of study carrels. These physical deliberations need to be integral to the layout of the library. The sensory technology will facilitate the independent use of the library by students across the range of disabilities.

Universal Design for Learning in School Libraries

The twentieth century will be long remembered for the Individuals with Disabilities Education Act, the legislation that provides students with disabilities access to a free and appropriate public education. In the twenty-first century, legislation such as the Elementary and Secondary Education Act of 2001 and Individuals with Disabilities Education Improvement Act of 2004 have paved the way for students with disabilities to gain requisite access to the general education curriculum through inclusion and the benefits of universal design for learning.

In the past, instruction for students with disabilities has focused mainly on teaching life, social, behavior, and knowledge-retention skills rather than on decision making about information retrieval, access, and organization. Library integration in the past centered around locating the library; learning how to select and check out a book, and then successfully return the book without damage; and how to watch videos about topics connected to classroom instruction. Students with disabilities did not associate the library with research. It was a place to sit quietly, walk in straight lines, and be on their best behavior.

Today's school library is transitioning beyond book borrowing to provide students multiple means of accessing the world, whether through traditional text, digital text, or alternative formats such as Talking Books, Braille Libraries, easy-to-read and large-print texts. Content is also available through a myriad of media, including CDs, DVDs, databases, digital catalogs, and indexes.

The richness and ranges of information sources underscore the importance of libraries for all students. However, the true value of resources can be realized only if they are accessible to users. For students with disabilities, the UDL framework, offered by the Center for Applied Special Technology (CAST) can pave the way toward inclusive and independent library experiences for all learners, offering flexible support while students learn academic content and important research skills.

Based on brain research on the recognition, strategic, and affective networks, UDL seeks to provide students multiple ways to attain, engage, and express ideas and information. The three principles of UDL—multiple means of representation, engagement, and expression—are outlined online at the National Center on Universal Design for Learning at <www.udlcenter.org/aboutudl/udlguidelines>. The site provides examples of UDL in action as presented in videos of classroom instruction and online resources. An overview of UDL guidelines is presented in figure 1.

![FIGURE 1. Universal Design for Learning Guidelines](image-url)

I. Provide Multiple Means of Representation

1. Provide options for perception
2. Provide options for language and symbols
3. Provide options for comprehension

II. Provide Multiple Means of Action and Expression

4. Provide options for physical action
5. Provide options for expressive skills and fluency
6. Provide options for executive functions

III. Provide Multiple Means of Engagement

7. Provide options for recruiting interest
8. Provide options for sustaining effort and persistence
9. Provide options for self-regulation

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Oregon School Library Information System <www.oslis.org> provides online library support for teachers and students at the elementary and secondary school levels. To quote its homepage, "OSLIS is a K–12 web portal providing access to quality licensed databases within an information literacy framework."

By incorporating the principles of UDL in planning resources for gathering, interpreting, and organizing information, school librarians can ensure that all students, including students with disabilities, can successfully use available resources (Parker 2007). What follows are options for multiple means of representing, engaging with and retrieving information, and expressive communication of information gathered.

School librarians can provide multiple means of representation of content by providing options for perception, language and symbols, and comprehension by customizing the display of information, illustrating key concepts, and highlighting critical features and big ideas. Multiple means of engagement exist when students have options for recruiting interest, sustaining effort and persistence, and self-regulation. Multiple means of expression are evident when students have options for physical actions (navigating and accessing tools), expressive skills and fluency (media for communication, composition, and problem solving), and executive functions (UDL Guidelines, 2008). An online resource, the Oregon School Library Information System is an excellent example.
levels. What follows is a discussion of how each category of information reflects the UDL guidelines.

**How to Do Research**

The "Learn How to Do Research" link for elementary students presents a collection of links designed to guide the user through the research process—from defining the topic to planning, researching, creating, publishing, and reflecting. Although the organization is the same for secondary student users, the resources presented are age-appropriate, reflecting a clear difference between elementary and secondary students.

The "Learn How to Do Research" link for teachers provides access to teacher resources, including templates, organizers, and notes about how to research a topic. Resources for elementary teachers are different from those offered to secondary teachers. Resources for secondary teachers are the same resources made available to secondary students. Web designers address accessibility by providing users options for text size (large, medium, or small) and incorporating access keys into the site design. Access keys also help users to navigate the site using the keyboard. These accessibility components are in accordance with the Web Content Accessibility Guidelines (WCAG v1.0).

The "Learn How to Do Research" link provides access to multiple means of representation to ensure that users gain a clear understanding of each concept related to conducting research. The display of information is customized age-appropriately for various audiences. To ensure understanding of concepts, illustrations are included and "key words" are hyperlinked with full explanations readily available for users. The organization of pages with hyperlinks on each page provides students the support they need to navigate the process. Big ideas and critical features of each concept are clearly presented after clicking on one of the four icons: plan, research, create, and present (see <http://elementary.oslis.org/learn-to-research>).

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Students can be multiply engaged in this section of the Web resources simply by clicking on the appropriate icon and following guidelines as presented. Embedded in the site are options for recruiting interest, sustaining effort and persistence, and options for self-regulation. This link also provides access to multiple means of expression. Students can express ideas, topics, and research plans using graphic organizers readily embedded in the Web resource.

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**Find Information**

The "Find Information" link gives students access to multiple resources for finding information on the webpage. For elementary students, nine information search resources are presented as icons, with and without tutorials. The InfoBits and InfoTrac links provide tutorials on how to use the resource. The options at <http://secondary.oslis.org/find-information> are more extensive for secondary learners. Secondary students can access information on opposing viewpoints, read about health issues, and access e-books and English Language Learner resources. Six of the resources have video tutorials with closed captioning to support multiple users. Students can access references, newspapers, magazines, maps, charts, and...

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pictures. For some references, students can access digital images along with MP3 files.

The site supports UDL. Most resources available through "Find Information" icons provide users multiple means of representing information on a topic. Print directions are easily accessible. When a video tutorial is available, it guides the user through the process of using the resource. The video and closed captioning supports learners with hearing impairments who can read text for understanding. The audio file provides learners with vision impairments to access information audibly. These resources are also valuable to students who hear, see, and read quite well. Such users access the information to activate prior knowledge and to clarify misunderstandings about finding information.

The "Find Information" resources provide students multiple ways of engaging with topic concepts and information. Students have a variety of search mechanisms readily available. Students can navigate the site through prominent icons and can interface with resources by accessing navigation tools, watching videos, or by choosing the search icons that best match their topics. Options are readily available for practice with the Web resources and research strategy development.

This link also gives students access to multiple means of expression. Students can download high-quality digital images and articles by subject. They may choose to research their topics relative to opposing viewpoints, the health and wellness center, or newspaper entries. Navigating each of these resources facilitates users' ability to manage information and resources while guiding students' goal setting, and supporting research planning and management of resources.

Cite My Sources
The "Cite My Sources" link <http://secondary.oslis.org/cite-sources> provides access to an interactive guide for citing a resource using MLA or APA guidelines. Students choose from information types (e.g., books, journal, website) and develop a citation. The page has an interactive resource for citing sources. One resource includes step-by-step directions through the process. Students can also download worksheets and citation examples to scaffold their understanding about how to cite sources used.

Conclusion
The resources available in the Oregon School Library site offer an excellent example of how to support student learning using a UDL framework. Without UD and UDL, the school library gives students with disabilities only limited access to library resources. School librarians must work closely with general education and special education teachers to offer specific assistance to all learners. Librarians must provide multiple ways to retrieve, manage, interpret, critique, and present information (see figure 2). Incorporation of UD and UDL into the library context can greatly enhance the library experiences of diverse students, leading to inclusion and independence for students with disabilities.

FIGURE 2. Strategic steps toward inclusion and independent use of library resources.
To support students with disabilities in school libraries, provide the following resources:

1) Readily-accessible iPad/iTouch technology for use in the library

2) Audio, video, and interactive tutorials, which support library navigation and demonstrate how to use library resources; locate printed directions and multimedia resources in strategic locations:
   a. "how to find books" in or near the book stacks
   b. "how to use reference resources" near the reference stacks
   c. "how to find periodicals" near the periodicals section
   d. "how to conduct online searches" near the computer

3) Software and online resources
   a. Dragon NaturallySpeaking software—computer types as the user speaks
   b. Inspiration/kidspiration software—graphic organizers for planning and organizing information
   c. Photostory, glogster, prezi, ppt, digital stories—presentation resources
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Works Cited:


