Print Disabilities, Libraries, and Higher Education

In the United States, library services for the blind began in the 19th century, in the large public libraries of Boston, Chicago, New York, Philadelphia, and Detroit. In 1931, the Pratt-Smoot Act established the National Library Service for the Blind and Physically Handicapped through the Library of Congress.[6] The Canadian Free Library for the Blind was established in Toronto in 1906.[7]

The universe of publishing consisted of printed books, magazines, and journals, and only a small percentage of that annual output was made accessible first in braille and later in "talking books." Blind readers, well aware of the inherent limitations of the printed page and the resources required to reformat it into braille or performed audio, refer to the era of print publishing as a "book famine." The digital revolution in publishing, including electronic texts, was supposed to end that famine—as electronic texts could, in theory, be processed directly by adaptive technologies designed to serve the print disabled. But an analysis of information technology and digital publishing instead tells a mixed story of progress and regress, of decentralization, lack of industry standards, and a host of reasons why, in 2012, advocacy for technological accessibility for the print disabled is urgent.

A print-disabled person is someone who cannot effectively read print because of a visual, physical, perceptual, developmental, cognitive, or learning disability. The definition and measurement of "learning disability" entered the educational parlance in the 1960s, and the US government increased funding for K–12 resources to address this growing concern. By the 1970s, this newly identified population began to enter colleges and universities. The Rehabilitation Act of 1973, as amended, established nondiscrimination requirements for all entities receiving federal funds, and in 1977, a critical mass of campus entities serving students with a range of disabilities formed a national association, the Association of Higher Education and Disability (AHEAD), establishing professional and service standards.[8] The world of higher education, at this point, consisted of physical structures to be navigated, traditional classroom instruction to be effectively conveyed and captured, and printed texts to be studied.

In 1990, a new social and cultural vision of disability and public participation was expressed and compelled by the ADA. Inclusion and mainstreaming prevailed in K–12 special education, and that population entered colleges and universities in the 1990s and 2000s.[9] In the still largely analog world of 1990, most books were not available in formats accessible to the blind. Assistive and adaptive technologies to reformat printed text emerged and made a great impact.

SIDEBAR: ADAPTIVE TECHNOLOGY FOR PRINT DISABILITIES

Adaptive technology, also known as assistive technology, refers to a wide variety of tools to help people with disabilities. The adaptive technology needs of print-disabled users vary. Tools used by the blind differ from those with severe or moderate vision impairment. The adaptive technology for compensating for visual impairments can take a variety of forms and typically utilize a combination of technologies. Below are examples of some of the most common building-block technologies used in adaptive technology tools to address visual impairments.

- **Digital Scanning**—Computer hardware and software to convert printed material to digital form.
- **Optical Character Recognition (OCR)**—The process of converting printed characters from a digital scan into machine-readable electronic text.
- **Synthesized Speech**—A computerized audio representation of human speech used to read aloud text and describe visual elements.
- **Text-to-Speech (TTS)**—The computerized process of converting electronic text into synthesized speech.
- **Braille Translation Software**—Software that converts printed text into braille cells.

The specific user-facing adaptive technology tool or tools used by a person with print disabilities will vary based on a variety of factors, including access to tools, training and support in the use of these tools, as well as personal preference. Most of the user-facing adaptive technology tools, outlined below, require electronic text to be properly encoded for the tool to work. It is this basic requirement that is the greatest barrier to making print library collections and library-mediated digital resources accessible.

Examples of the most commonly used adaptive technology tools are:

- **Screen Magnifier**—Hardware or software that enlarges the display of a computer screen.
- **Screen-Reader Software**—Software that provides voice output for items displayed on a computer screen. Unlike a pre-recorded audio book, this software facilitates independent navigation through the content and enables users to read text at their preferred speed. It also has the capacity to allow the reader to get structural information, such as punctuation and paragraphing through differential pauses and to move, when necessary, character by character to learn the spelling of a given word.
- **Scan-and-Read Software**—Software that converts a printed document to electronic text using a combination of digital scanning, optical character recognition software, and synthesized speech.
- **Braille Embosser**—A specialized printer that produces tactile braille cells, typically using input from braille translation software.
- **Refreshable Braille Displays**—An electro-mechanical device for displaying braille characters.

Adaptive technologies opened new doors to people with print disabilities and raised their expectations about information access. In an open letter to President Clinton in 2000, university presidents recognized the importance of making information and communications technologies more accessible for individuals with disabilities and noted that "people with disabilities will find it much easier to live, learn and work as they enter the Information Age."[10]

On college and university campuses, libraries were in some cases early partners in providing these services, spaces, and equipment, but this function was still seen as the responsibility of disability services offices. It was those offices that offered reformatted, accessible textbooks and other classroom materials to their registered students and who later worked with publishers to receive born-digital files to distribute to students.

Against the backdrop of this recent history and set of campus dynamics, information technology and digital publishing exploded, and research libraries found themselves transforming their role in research, teaching, and learning. Research libraries occupy a unique space in these transformative times—as stewards of long-held, carefully built print collections and as partners in the emerging cyber-infrastructure that propels and sustains e-research. In the past decade, research libraries have collectively digitized millions of print volumes, moved collection expenditures decisively from print to electronic resources, and invested in a range of desktop and mobile technologies for accessing and manipulating both print and electronic information for diverse user populations. Research libraries now have a central role to play in the digital age in providing equitable access to information resources to their users. This report will highlight emerging and promising strategies to meet this goal of enhancing access to the print disabled.

Research library investments in digital content have ranged from locally built websites to commercially licensed electronic databases, online catalogs, e-journals, and e-books. The marketplace of digital educational goods and services has opened some doors of accessibility while closing others. This report will address the technological, legal, and service factors in research libraries with respect to print disability. These factors resonate closely with the existing research library agenda to make scholarly communication more open, to foster independence among the user base by teaching information literacy, to honor and invest in diversity, as well as to focus on the growing trend toward universal design in instruction. Libraries thus provide a basis for ongoing and new partnerships and collaboration both inside and outside of individual institutions.

Just as the ground has shifted for research libraries with respect to their responsibilities to the print-disabled community, so too has the ground shifted for disability services offices, who have from the outset been in the business of accommodations and individualized, specialized attention for students with disabilities. The concept of born-accessible materials is a key solution to an IT landscape that includes new players and new roles across the entire research institution.

In 2011, researchers at the University of Maryland posed the inclusion challenge to a range of institutional actors:

> Educators that work with students training to become developers—such as computer science faculty—could work to better incorporate accessibility into curricula, so that all developers are prepared to make accessible products and understand that accessibility is the socially responsible approach to development. Researchers in fields related to accessibility—such as computer science, information science, sociology, public policy, and communication—could also better support a culture of online accessibility by producing more research to contextualize the impacts of inaccessibility on people with disabilities, to support the development of accessible products, and to study policy options related to accessibility.[11]

Research libraries occupy a distinctive position in that they have multi-level relationships with a wide range of institutional entities. Working with content creators—such as faculty or other researchers—to use available accessibility features of authoring software in their own work could be an excellent opportunity for library outreach, engagement, and expertise.

Print Disabilities and the Population

The US Government Accountability Office has shown that the numbers of students with disabilities in post-secondary education is growing—with marked increases in cognitive disabilities such as dyslexia and autism, and growing populations such as returning veterans.[12] A Canadian government survey of 2006 found that disability among children had increased since 2001. Among Canadian children aged 5 to 14 that increase was from 4% to 4.6%. With regard to special education services, parents reported learning disabilities as the most likely reason their children were receiving services.[13]

The population of the print disabled is both significant and growing. The Reading Rights Coalition estimates that there are "30 million Americans who cannot read print because of blindness, dyslexia, spinal cord injury, and other print disabilities."[14] Notably, vision loss can be a consequence of other growing health concerns, such as diabetes, which increasingly affects people of all ages. Moreover, research libraries serve patrons of all ages, including students, faculty, staff, and alumni. According to the National Institutes of Health,

> With the aging of the population, the number of Americans with major eye diseases is increasing, and vision loss is becoming a major public health problem. By the year 2020, the number of people who are blind or have low vision is projected to increase substantially…Blindness or low vision affects 3.3 million Americans age 40 and over, or one in 28…This figure is projected to reach 5.5 million by the year 2020.[15]