

INFORMATION ACCESS FOR PEOPLE WITH DISABILITIES

In December 2003 The Pew Internet & American Life Project completed a study on computer use. The research found that the number of people using the Internet for information-seeking activities has grown 50% since 2000.

This increase was because of users wanting immediate access to information and wanting alternative resources for news and information other than those resources found in traditional print books, newspapers, and journals.¹

The study asked questions about Internet use by people with disabilities. Although the study found that far too few people with disabilities are online compared with the general population, those who were online were using the resources for basically the same reasons as those without disabilities.

A difference, however, was found between the two groups. If the Internet were not available to people without disabilities, they could conceivably find similar materials at the library or at a bookstore. People with disabilities, especially reading or vision (print) disabilities, don't have that option.

Information resources are no longer limited

Electronic information can be translated into any language needed. This technological advance may be one of the greatest intellectual aids for people who are blind, visually impaired, cognitively challenged, or hearing impaired.

Software programs are available to translate electronic text into Braille, speech, or sign language on command by the user. Blind and visually impaired people are no longer bound by the limitations imposed by the print world.

The Internet also offers people with mobility impairments a chance to stay connected with the community. People who are quadriplegic can still use the Internet. An interface exists for virtually everyone.

Before the development of this technology and the Web, many people with disabilities just gave up the hope for an education—not because they weren't smart enough but because of inaccessible reading materials. Lack of education meant the lack of opportunity to compete for jobs that support a moderate standard of living.

Now they have a chance to attend school either in the classroom or via distance-learning programs and compete in the job market. Access to electronic information enables them to keep the job.

People with disabilities do not have access to computers

The Internet has the potential to equalize the information gap between those people with disabilities and those without. Yet proportionately too few users with disabilities are online, compared with the nondisabled.

Researchers Colin Keane and Jel Macht of the Neil Squire Foundation (a Canadian organization committed to providing education, technology, and career development for people with physical disabilities) noted that the gap existed because many people with disabilities simply lacked access to computers with adaptive technologies (AT).

Their lack of access to computers with AT was not because they didn't want to own a computer—they couldn't afford to buy their own equipment. As a group, people with disabilities are poorer than other Americans and have a difficult time affording the extra expense of adaptive technology.²

Most public-access computers remain inaccessible

To compound matters, Keane and Macht found that people with certain disabilities generally find computer stations at public sites cannot be adjusted to accommodate their physical needs. Most lacked appropriate chairs and the needed accommodation software that could help them access the Internet. Keane and Macht found that, in certain instances, public-access workstations were located in remote parts of the building, which could not be easily accessed.

Overall the researchers found that the need for public computer access continues to exist for people with disabilities. This need exists in spite of legislation such as the Americans With Disability Act and Section 508 of the Rehabilitation Act of 1973, which strongly encourages equity to information for all.³ Public entities are not rising to the challenge of information for all.

Why does this phenomenon continue? Most of the time librarians simply don't know a need exists. They tend to address the needs of those people they see, rather than those they don't see.

If staff members do not see people with disabilities in the library, they assume that people with disabilities either do not need information or they are finding it somewhere else. Few librarians conclude that people with disabilities do not come into the library because the library does not have anything to offer.

Are people with disabilities in my community?

People with disabilities live in every community in the United States. Some regions and states have higher disability incidence rates than others.

During Census 2000, the U.S. Census Bureau counted 49.7 million people with some type of disability. This group represented 19.3% of the population, aged 5 and older, in the civilian noninstitutionalized population.⁴

Of this noninstitutionalized population, 3.6% reported having some sensory disability (involving hearing or seeing) and 8.2% reported having a physical condition that limited their ability to walk, climb stairs, or reach, lift, or carry items. An additional 4.8% reported having a physical, mental, or emotional condition that made learning, remembering, and concentrating difficult.⁵

People living in areas with an older population reported having a disability more often than those people living in areas with a more youthful population. The states of West Virginia, Kentucky, Arkansas, Mississippi, and Alabama showed the highest disability rates, and Alaska, Utah, and Minnesota showed the lowest incidence rate.

Looking for patrons with disabilities geographically ⁶					
Region	2000 population	% with disability	% with sensory disability	% with physical disability	% with mental disability
Northeast	49,386,446	19.2	3.3	7.7	4.6
Midwest	59,017,677	17.7	3.5	7.8	4.6
South	91,179,367	20.9	4.0	9.2	5.2
West	57,584,037	18.7	3.5	7.5	4.6

Source: Distribution of people with disabilities as reported in the 2000 U.S. Census.

Additional disability statistics to ponder

As staff members look at the community's demographics, they also should consider additional factors when developing long-range service goals. Some of these factors follow:

- 46.3% of people reporting having a disability had more than one disability.
- 51.4% of women and 60.1% of men with disabilities are employed, compared with 67.3% and 79.9% of those people without disabilities.
- 22% of adults with a disability stopped their education before receiving a high school diploma, compared with 14% of the nondisabled.
- 26% of the overall population has a college or graduate degree, compared to 18% of the disabled population.
- 29% of people with disabilities are 65 years of age or older.

Professionals who work with people with disabilities feel that, if anything, disability statistics are probably underrepresented. Most people only report the disability they consider their biggest challenge, which is usually a sensory need.

What does this information mean for the library? It means if the research staff looks at numbers only when planning equipment purchases, they may not realize the library needs to accommodate physical needs as well as sensory needs.

Take a real look at the library community

To see a real snapshot of the library community, consult the census charts (data broken down by counties) and keep eyes and ears open as you move about your community. Make inquiries to community and religious groups as to the disability incidence within their organizations.

Look at who is shopping in the stores; look at what type of new housing is being planned. If assisted-living facilities or rehabilitation facilities are in the works, chances are people with disabilities are and will continue to be a part of the library's community.

For the complete U.S. Census disability statistics, see www.census.gov/prod/2003pubs/c2kbr-17.pdf.

Most importantly, look to see who is or is not using your computer terminals. If staff do not report having any people with disabilities entering your library, then the library should try to determine why they do not.

So why is library Internet access so important?

Visiting the library is a normal thing to do

Going to the library is a part of life—everyone should be able to do it. Using libraries provides the opportunity to seek and find information as well as borrow recreational materials. Libraries are such a necessity that they should be for everyone.

For many adults, the public library staff taught them how to find treasured free information when they were children. Now the library could naturally be the place where library staff teach them how to find new treasures on the Internet.

Rising to the challenge of teaching today's patrons how to seek information, many libraries are offering free computer classes and find that adults are once again visiting the library. All patrons, regardless of infirmity, should be able to learn as the customary thing to do.

People with disabilities lack discretionary spending money

Aside from the naturalness of using the public library, people with disabilities may not have any other choice when seeking access to computers because, as a group, people with disabilities have significantly lower incomes than those people without disabilities. Their income is startling—a third of the population live in a household with less than \$20,000 annual income.⁷ This low income level makes paying for a computer and Internet service near impossible.

Although the basic computer has dropped in price, assistive devices have not. For instance a large-button keyboard can cost five times more than a traditional keyboard; a head-mounted mouse can cost 10 times what a standard mouse would cost. Screen readers cost a minimum of \$500; a refreshable Braille display can cost \$5,000.

A person needing some type of assistive software or hardware needs anywhere from \$500 to \$5,000 more than the nondisabled user before going online.

Libraries offer a try-it-before-you-buy-it option

For some, owning a computer is a pipedream. For others who are employed or have some income, it is doable but carries an unknown economic risk, which many patrons cannot afford to take.

Patrons should reasonably have a sense that they can use the equipment. Most rehabilitation facilities and assistive-technology vendors do not allow the client free classroom time or extensive trial periods. The classroom sessions are costly (\$50 to \$75 per hour) for someone on a fixed budget.

Low-income people need to try the equipment free (or for a nominal fee). The library can be the place where they can try the equipment.

What do people with disabilities seek on the Internet?

Like most people, those with disabilities want to connect to someone else, making e-mail the top reason why people want to go online. People with disabilities go online for other reasons too. Users with disabilities are more likely to look for medical information (75% versus 59% nondisabled), play a game (45% versus 35%), and research online for information about a particular person (37% versus 26%).⁸

More and more agencies are referring clients with questions to seek answers on the Web, without offering other alternatives to find the information.

The Internet also gives people with disabilities the same opportunities to know what is happening in their community, locate a new recipe, learn about Mars, and read what the politicians are promising. The Internet can help people with disabilities assimilate within the community and contribute to its growth.

Creating an accessibility plan for the disabled at your library

Total accessibility is usually a building project

Providing the complete array of hardware and software that all people may need to access electronic information is not simple. For most libraries the task is a building project, with new technologies added as funding permits. Formulating short- and long-term goals is critical, and librarians should ensure patrons and disability rights advocates are part of the planning process.

Sensitivity training for staff is the first step

Developing long- and short-term goals can be both fun and challenging and should be a team project. Everyone on the staff should receive sensitivity training so they are aware of how to provide service in a welcoming, responsive, appropriate, and helpful manner. Staff should be aware of what is available and how people can use the technology to access information.

Developing the plan and making it work

The library should form an advisory committee composed of a representative cross-section of staff (that is, all service levels including administrators, librarians, computer aides, computer technicians, clerks), community residents with disabilities, service providers, advocates, and rehabilitation professionals. Be sure all disabilities are represented, as blind people do not have the same needs as hearing-impaired people.

When planning for accessible technology, be aware of the need to use more than one personal computer to provide universal access because the hardware solution added for the person with mobility impairment may cause problems with the software added for the person with a visual impairment.

Do not be afraid to ask questions of patrons who are using the adaptive technology; their answers help provide solutions everyone can live with.

The committee should:

- Survey or discuss the special access needs of users and nonusers as to their library needs. Ask which needs are or are not being met by the library.
- Develop a list of hardware and software needs and estimate their cost.
- Decide the amount of general funds that can be allocated to the effort, then research and submit grant proposals for equipment donations and general operating funds.
- Formulate a workable timeline for implementation.
- Appoint one staff member (and backup) to be in charge of the project. This person should be the go-to person in case questions arise or problems develop.
- Create an in-service training module formulated to train staff on how to use equipment. Create refresher courses in equipment usage for staff.
- Outline a marketing plan to reach patrons with disabilities who are not using the library. Committee members should all take responsibility of reaching targeted audiences.
- Create a subgroup of Web and database watchers. The watchers would monitor the library's website to ensure modifications and additions do not render it inaccessible. Likewise, they'd monitor costly subscription databases too. Providing access has no meaning if the website does not follow accessibility guidelines.

Print and distribute the plan to the community as well as post it on appropriate websites. Make large print, recorded, and Braille formats available too.

When the Calgary Public Library (Canada) developed a plan to make information more accessible to patrons with print impairments, administrators wisely formed a planning and implementation committee that consisted of consumers, IT staff, librarians, and the purchasing agent. Thanks to their teamwork, eight accessible workstations are available for public use throughout Calgary.

Judith M. Umbach, chair of the Calgary Public Library Board Manager of Innovation, Information Technology Services with the City of Calgary, said the library realized early on that the success of Accessible Library Experience (ALEX) would be in making the process right as opposed to making the technology right.⁹ Calgary's process is worth emulating.

The AT learning curve for staff and patrons

A reality of integrating AT into library services is that a learning curve will always exist, both for staff and the patrons. Staff must become comfortable with the patrons and the equipment to make service enhancements work. Although the use of AT is not hard, a learning curve exists. The keyword for both groups is patience. Training tips for staff are included in Chapter 6.

IT: Information technology

Find ALEX information at: Special Library Association Western Canada Chapter. *Wired West*, vol. 7, no. 2 Winter 2004. www.sla.org/chapter/cwcn/wwest/v6n2/blackhall.htm and Umbach, Judith. "Considering It All Gaining Access." www.thealbertalibrary.ab.ca/netspeed/netspd2002/presentations/A5Umbach.ppt

10 tips for teaching AT to patrons

Although each training session depends on individual temperament and ability to learn, a suggested approach follows. Will Reed, librarian and veteran adaptive technology instructor at the Cleveland Public Library, offers the following tips:

- Conduct an interview process with patrons to determine what they want to be able to do with a PC as well as what they may already know about PCs and electronic information retrieval. Note: Patrons should have a working knowledge of the keyboard.
- Explain what basic electronic and reference materials are available to patrons as well as how they can be used. Be aware that some patrons have never used a library because of their disability.
- Set up a learning schedule. Patrons learn at their own pace. Do not push patrons past their endurance level.
- Encourage patrons to ask questions and take notes. Some patrons may wish to tape the sessions to review at a later time.
- Encourage patrons to explore the AT and PC at will.
- Teach patrons how to perform tasks by reviewing each process at the end of a session.
- Start each new lesson with a recap of the last lesson. Do not move on until patrons understand what they are doing.
- In the early stages of the learning process, consider giving patrons homework assignments to encourage them to practice between lessons. Staff can reserve the AT equipment for the patrons.
- Provide help sheets formatted in a medium the patron can use.
- Resist the temptation to perform tasks for the patrons.

How patrons with visual impairments access the Internet

According to a study by Microsoft, one in four computer users has a visual impairment and may benefit from accessible technology.¹⁰ These findings could translate into one out of every four library patrons (and staff) needing some type of computer access aid.

The report supports the theory that the type of visual impairment and the degree of visual impairment dictate the type of assistive technology people will be comfortable using.

People who require the use of AT may have some usable vision and may be able to drive but do not require the use of a cane to navigate in familiar territory. Their visual impairment is what is called a hidden disability. These people still rely on their eyes to intake most information and tend to want to use screen magnification programs.

Others who do not have any usable vision must rely on screen readers or Braille displays to intake information. Fortunately, whatever the impairment, a solution exists. Equal parts of trial, error, and patience may be needed to find the right solution, but the mode of access is always there.

Hardware that helps users with visual impairments

A flat-screen monitor that is at least 19 inches across is essential. If finances permit, mount the monitor to an adjustable arm to assist patrons whose vision is so low as to require them to come within an inch of the screen. The adjustable arm allows the monitor to be brought up to the patron's viewing level as opposed to the patron coming down to the monitor.

Remember to provide a laser printer so patrons can print documents that they may later read.

Software that helps users with visual impairments

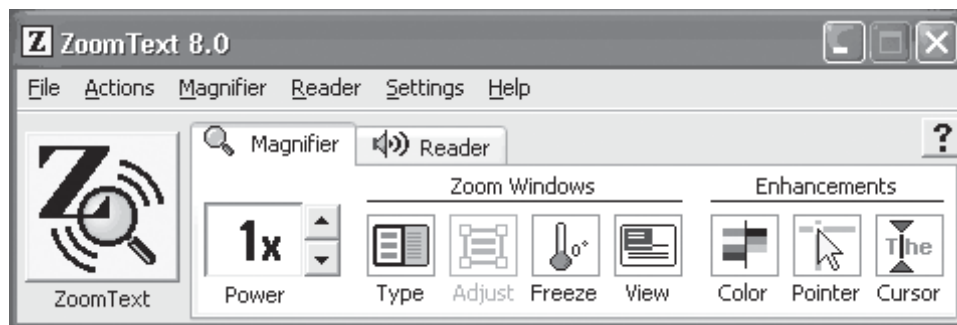
Screen-enlarging software

Three major companies produce software that enlarges computer print displays. The software is priced from \$550 to \$700. Although users have their personal preferences, the products are all easy to use, are upgraded regularly, have good customer support, and are available for multiple-users licensing. All magnify text at least 16X and allow the user to adapt the colors of Web pages, font size, and type of cursor or pointer.

All the programs have been evaluated by staff of The American Foundation for the Blind's publication, *Access World*, and may be reviewed in their entirety online.

ZoomText

Low-vision users can use ZoomText's (Version 8.0) hot key commands to access the Internet with greater efficiency and accuracy. For example, one command helps the user easily locate all the links displayed on the Web page, which can be a difficult task or impossible task on poorly designed pages.



ZoomText also makes a screen magnification program with a speech reader assist. This software is helpful for people who are not confident they are correctly seeing the screen. It gives voice output to whatever is printed on the screen. A feature, typing echo, helps patrons new to keyboarding gain confidence that their fingers are typing what they want them to type.

When tested by the staff of the American Foundation for the Blind, researchers found the installation was straightforward and generally acceptable.¹¹

See a complete evaluation of ZoomText and MAGic at www.afb.org/afbpres/pub.asp?DOCID=aw040503.

Zoomtext,
www.aisquared.com

MAGic,
www.freedomscientific.com

Read the entire American Foundation for the Blind's evaluation at www.afb.org/afbpress/pub.asp?DOCID=aw040503.

Dolphin,
www.dolphinusa.com

Read an evaluation at www.afb.org/afbpress/pub.asp?DocID=aw040402.

Product testers noted, too, that the command keys were color-coded and labeled in large print. This benefit helps visually impaired users who have cognitive problems and require actions to be spelled out.

MAGic for Windows

MAGic for Windows (8.02), a software product of Freedom Scientific, allows low-vision patrons to access the Internet by providing screen magnification.

For libraries that have Spanish-speaking patrons, note that this product has a bilingual user interface that allows menus, help information, and dialog boxes to be spoken in either English or Spanish.

When tested by the staff of the American Foundation for the Blind, the software was found to be easy to install, and it came with a well-organized user's guide that included pullout reference cards.

The biggest plus for selecting MAGic (over any other software magnifier) is that it worked seamlessly with the company's screen reader, JAWS. MAGic automatically senses that JAWS is available and automatically turns off all speech features. This feature avoids a lot of confusion for novice users and busy staff.¹²

Dolphin Lunar, Lunar Plus, and Supernova

Dolphin Computer Access is a United Kingdom-based company and has a U.S. office. Although the company is relatively unknown in the United States, many users attest to the versatility of its product.

Lunar offers the user the greatest magnification of any available product (32 power), although professionals do not see this benefit as a plus because they think much is lost when using that great of a magnification since the user sees too little of the Web page.¹³

Although the basic product (Lunar) is much the same as two previously mentioned competitors, Lunar Plus, the speech-assist program, uses the Orpheus Speech System and also offers Microsoft's MSAPI Speech Synthesizer. The Orpheus pronunciation system recognizes similar words by context and offers users a choice of nine Orpheus voices and the ability to create their own. The user also is given a choice of 18 languages.

When reviewed by the American Foundation of the Blind, the reviewers agreed that it was a robust program but said the audio CD training tutorial was poorly organized and difficult to understand. Competing software companies, though, do not even attempt to offer one.

The reviewers did not test Dolphin's Supernova Reader Magnifier, which is the only screen reader offering combined magnification, speech, and Braille. Libraries have no need to purchase a separate screen reader and screen magnifier.

Be aware, though, that the Dolphin's market share in the United States is small. You likely won't find patrons in the library's area who know how to use the product, so all patrons would have to be trained. This problem could change if Dolphin launches an aggressive marketing campaign.

Screen magnifiers and closed circuit television (CCTV)

Low-vision users wishing to consult text documents when searching the Internet can benefit from using a CCTV. CCTVs are a versatile technology and can be used independently of a computer.

Text documents are placed on the viewing table and can be displayed on the device's monitor (if applicable) or sent to the computer's monitor. The latter technique helps students who are using a textbook or teacher's handouts to receive information or directions as to how to use the Internet. Information on selecting the right CCTV for your library can be found on the Abledata database and the American Foundation for the Blind's website.

Refreshable Braille, synthetic speech system, and screen readers

Patrons without usable vision must solely rely on another sense. If they are Braille readers, they may use the sense of touch to see what is on the computer screen. If they are not Braille readers, they may rely on their sense of hearing and use a synthetic speech system. Both are reliable, effective ways to translate text.

The task of a synthetic speech and screen-reading system

A synthetic speech system is composed of two parts: the synthesizer that does the speaking and the screen reader that tells the synthesizer what to say. Their programming includes all the phonemes and grammatical rules of a language, which usually allow them to pronounce words correctly.

The system reads aloud the text that is presented to the user on the computer screen. Read items include icons, menus, text, punctuation, and control buttons. The system also reads aloud what is happening on the screen, such as which dialog boxes are opening on the screen, so users can use them with a graphical user interface (GUI).

The system, however, cannot interpret images on the screen. If a picture of an apple is on the screen, but the picture is not tagged with an alternate descriptive tag, the reader will never know the picture of an apple exists.

A screen reader can only present one word at a time to the user. So, unlike a sighted user, who can see the entire screen and unconsciously reads chunks of print, the screen reader user hears a string of text.

The task of a refreshable Braille display

For computer users who need or prefer to use Braille, screen readers also can present this text via a refreshable Braille display. Refreshable Braille displays, although expensive (\$4,000 to \$5,000), are ingenious.

As the cursor follows the lines of text displayed on the screen, tiny pin actuators raise and lower to translate the print into Braille cells, which the patrons are able to feel with their fingertips. Moving to the next line refreshes the pin alignment to reflect the new text.

Abledata database,
www.abledata.com

American Foundation
for the Blind,
www.afb.org

For a quick introduction to screen readers, visit the University of Wisconsin's DO-IT's website at www.doit.wisc.edu/accessibility/video/intro.asp. This short video gives viewers a feel for what a screen reader does.

Screen readers

Like most task-specific software, not many manufacturers make them—meaning most people use one of four products. All products allow the user to mute the speech with one keystroke; adjust the speech, pitch, and volume of the voice; and repeat what was last said.

All products also give users the ability to regulate whether the reader designates capital letters, punctuation, and the ability to have menus, dialog boxes, tool tips, system messages, and other text and graphical information read back to them.

Since the price paid for the product is in direct relationship to features desired, first determine what software users in the library's service area are using. This task can be accomplished by contacting an AT vendor in the area who sells all products or by calling a training center or membership organization composed of blind and visually impaired people.

Once you buy a type of screen reader, you are most likely to stay with it, since upgrades are less costly than buying a new product. The prices of the screen readers range from \$400 to \$1,200, with the most expensive product having the most functionality.

All screen readers read the text, adhere to punctuation, have hot keys that allow the user to quickly move about the page, and perform tasks such as rereading words, sentences, or links. Additionally, all have demonstration disks and downloadable trial copies available.

The companies have good tech support and are able to walk sighted people through the installation process. Workshops are conducted at the companies' home bases.

Before selecting a screen-reading package, staff should check the system requirements of the product. All manufacturers state known incompatibility problems in regard to commercial video and sound cards.

Staff should evaluate the screen-reading systems using the following criteria:¹⁴

- Determine which synthesizers are supported.
- Assess the library applications that will likely be used by patrons to determine if some screen readers will not work with them, no matter the skill level of the user. Be aware of those applications that allow staff to develop accommodations or seek alternative accessible applications.
- Determine how much automatic speech the screen reader gives when the user is performing standard Windows functions (such as selecting menu items or moving through items in dialog boxes).
- Determine the difficulty of changing simple standard features such as voice rate or the choice of a reading key.
- Determine what the user must do to make an unfriendly program work well enough to be usable.
- Do any useful and unique features help patrons in the library setting?
- Does the screen reader pose any added problems to Windows use?
- Is the manual accessible and accurate for both the staff and the patron?
- Is the tutorial in a usable format for the patron?

- Is an expert on the product locally available? Is the licensing agreement liberal?

One of the most important questions is 'will it interfere with other products the library owns?' The library wouldn't likely abandon other products because the screen reader is not compatible—the screen reader will be sacked. Query vendors on compatibility, but take the time to find the real answer by trying the readers while other products are running.

Screen readers to consider

JAWS (Job Access With Speech)

The Job Access With Speech (JAWS), designed by Freedom Scientific, is probably the most popular screen reader in North America. The newest version incorporates a tool called PlaceMarkers, which aids users in finding their way back to specific passages in electronic documents.

Using Virtual Cursor Technology (VCT) people can mark sentences, paragraphs, and so on, within electronic documents that they may want to refer to at another time or reference for another reader.

Additionally the Speech and Sounds Manager gives users an opportunity to modify how contextual information is conveyed. For example, JAWS can be directed to speak boldface text or quotes in a different voice. Additionally, JAWS users also can set a particular sound to indicate cursor focus, capitalization, and indents.

Window-Eyes

Window-Eyes is produced by GW Micro and is perhaps the second most popular screen-reading program in the United States and Canada.

People choose Window-Eyes because it costs less than other software, has the basic features most people require and is user friendly. Window-Eyes is compatible with most speech software synthesizers. The limitation for Window-Eyes is that as users gain confidence in using it with the Internet, they want to do more and the product cannot grow with them.

Hal by Dolphin

Hal is manufactured by Dolphin Products and appears to be gaining a following in the United States. This product gives the user flexibility for speech output since it provides users with a choice of two software speech synthesizers: Dolphin Orpheus Speech System and Microsoft's MSAPI Speech Synthesizer.

The Orpheus system allows the user to teach and modify the way in which the synthesizer sees and pronounces words. Additionally, the Orpheus system has the ability to correctly pronounce words that look similar by assessing them in context.

This product offers users a choice of 19 languages, including Arabic, which makes it a good choice in locations with a diverse patron population.

Home Page Reader by IBM

Home Page Reader (HPR) uses IBM's ViaVoice text-to-speech (TTS) synthesizer for interpreting text into speech and is priced at \$150. HPR recognizes and voices text, frames, image and text links, alternate text for images and image maps,

JAWS,
www.freedomscientific.com/
fs_products/
software_jaws.asp

Window-Eyes,
www.gwmicro.com

HAL,
www.dolphinusa.com

HPR, www-3.ibm.com/
able/hpr.html

Duxbury,
www.duxburysystems.com

NFB, www.nfb.org/
nfbtrans.htm

Consult the NLS Reference Circular: Braille Literacy Resources for additional information on Braille devices for the library at www.loc.gov/nls/reference/circulars/brailleliteracy.html.

OutSpoken,
www.synapseadaptive.com/alva/outspoken/active_areas_in_outspoken.htm and
www.cnib.ca/tech_aids/screenreaders/outspoken3.htm

form elements including JavaScript, graphics descriptions, text in column format, and data input fields.

HPR defaults to a male voice reading text and a female voice reading links; however, users can customize these audio cues by choosing the gender and age of the voice on the system. Home Page Reader includes an integrated electronic mail feature, Home Page Mailer, which provides blind and low-vision users access to e-mail.

So what's the catch? HPR only works with Web pages. If your library does not provide word-processing programs for public use, this option may well be your answer.

Braille translating

Braille users are adamant about using Braille. They rightfully state that it only through reading information in Braille can they be truly literate and equal to those people reading print. If budgets permit, a machine that translates text into Braille would be a useful purchase since many patrons cannot afford to purchase their own system.

Translating and printing Braille

Translating text into Braille for embossing is a simple task. The user only needs to have access to a Braille translating program. Duxbury Systems supports two different Braille translators: the Duxbury Braille Translator (DDBT) and Megadots (DOS application). The DBT, a multiplatform, multilanguage product, is recognized as the most functional commercial translator in the market.

The National Federation of the Blind (NFB) also offers a shareware Braille translator, called NFBTRANS. It is a self-extracting executable file. If funds are limited, consider it.

Replicating the translated Braille requires a specially designed machine called an embosser. Many such machines are in the marketplace, and they range in price from \$2,000 to \$4,000 for a good, utilitarian unit.

Screen readers and Braille displays

OutSpoken Ensemble by Alva. Some Braille display users swear by OutSpoken, a screen reader that works in harmony with a Braille display. The software has powerful word-processing attributes; that is, it speaks and shows on a Braille display the content of cells when navigating and selecting in Microsoft Excel spreadsheets.

Some of its Web tools include message boxes, warning dialog boxes, and tool-tips. OutSpoken Ensemble also reads the content of dialog boxes and document windows with natural pauses and voice inflections, making information intelligible to the user in English, French, Italian, Spanish, German, Dutch, Portuguese, Swedish, Norwegian, Finnish, Czech, or Polish.

Scanner systems aid both the visually impaired and the learning disabled

Scanners have become more efficient in recent years, and many blind and visually impaired users value them. Any printed text can be scanned into a computer, and by using a simple command, the text is translated and read aloud using one of several screen synthesizers.

The learning curve for using this piece of technology is not steep. The hardest part of this process is handling the time for scanning a long book (actually only seconds per page). Professionals are seeking to lessen this burden by creating a library of scanned texts.

Bookshare is a repository for scanned texts. Professionals might want to consider subscribing to the service for their patrons with disabilities as the collection of scanned texts, ready for downloading, now is in excess of 15,000 books.

A specialized reading machine—VERA

Very Easy Reading Appliance (VERA) is a stand-alone system that takes a picture of the printed material with its scanner and then reads the text in synthesized speech through an internal synthesizer. Librarians don't need to connect it to a computer unless patrons want to view the text in large print.

VERA uses a keypad that has large keys with colorful tactile markings and intuitive placement. Patrons can read a page continuously, line-by-line, or word-by-word, and they can save documents or entire books in its simple file system. Plug it in, turn it on, and begin reading.

Scanning systems for patrons with learning disabilities

A person with a learning disability (LD) is by no means less intelligent than a person without the disability. A learning disability is a "disorder that affects people's ability to either interpret what they see and hear or link information from different parts of the brain...these limitations can manifest themselves through developmental reading disorders or developmental speech and language disorders."¹⁵

People with learning disabilities can benefit from simultaneously seeing and hearing text. The highlighting of the text as it is read helps to draw the user's attention to the text. Several popular software programs are specifically designed to help people with learning disabilities.

Kurzweil 3000. One reading comprehension software, named after its designer, is called Kurzweil 3000. The software uses a synthesized human voice to read online text and was developed primarily to serve the needs of those people with learning disabilities, but other computer users also can benefit from its features. The software converts text to synthesized speech as it highlights what it reads aloud.

It gives users independent access to magazines, the Web, textbooks, and PDFs. Additionally, it enables users to hear their own writing spoken aloud, which can be invaluable for self-editing.

Specialists in the field of learning disabilities say the software's highlighting features make it helpful. Students can control reading speed and the size of displayed print and can use an online dictionary to help with new vocabulary since the software reads the definitions aloud.

Read and Write Gold. Read and Write Gold, a reading-comprehension software product of textHelp! (based in Northern Ireland), has spell checking based on phonic errors; a thesaurus with dictionary definitions and homophone checking with meanings; word prediction, which has choices for the way the words are ordered; and more. It includes scanning, access to the Web for fact finding and storing notes, exporting in MP3 or wave format, a scientific talking calculator, and a pronunciation guide.

Bookshare,
www.bookshare.org

VERA,
www.freedomscientific.com

Kurzweil 3000,
www.kurzweiledu.com

Read and Write Gold,
www.texthelp.com

WYNN program,
www.freedomscientific.com

What You Need Now—Wynn Wizard and Wynn Reader. Freedom Scientific supports two versions of WYNN (What You Need Now). Both WYNN programs support the simultaneous reading and highlighting of the text but differ in price and functionality.

WYNN Wizard includes optical character recognition (OCR) the ability to scan printed pages and convert them into electronic text. Speech synthesis enables this scanned text to be read aloud. Additionally, WYNN Wizard can read word-processing documents, PDF files, text files, and the Internet.

WYNN Reader includes all features of WYNN Wizard except OCR scanning. It includes editing capabilities—the ability to modify electronic files, scanned pages, or newly created documents. The software has the ability to read the Internet and e-mail.

The network version of the software works just like the regular versions, but it is connected via a LAN or WAN. It is installed with floating network licenses and has no limit to how many computers it can be installed on. It does, however, have a limit to how many simultaneous users can be logged in.

Professionals advise equipping readers with headphones for both privacy concerns and to aid concentration in using listening skills.

Voice input systems in the public environment

Voice input systems allow users to speak commands, as opposed to typing a command or using a mouse. The product is inexpensive and fairly easy to use. A week or two of frequent use, though, is needed for the computer to learn to recognize users' voices.

Although voice input systems are used by people with learning disabilities and physical impairments, they are not recommended in the public environment, unless staff have the ability to store voice files. Voice files take several megabytes of storage. Storing the files on disk and reloading also would be a time-consuming task. If no other practical solution exists, though, consider it.

Librarians have a common misconception that voice input works well for people who are visually impaired. The problem lies with the inability to effectively know if the computer correctly understands the words that they are speaking since they cannot see the words displayed on the screen.

IBM ViaVoice Systems and Dragon Naturally Speaking are two products being used by people with learning and physical impairments to access computer information. Both products are modestly priced and multilingual. Both are supported by ScanSoft.

Consult the manufacturer's website for more information or the Adaptive Technology Resource Centre. Also see the overview of the iCommunicator system in the hearing-impaired section of this chapter.

Solutions for patrons with mobility/orthopedic impairments

As a demographic, patrons with mobility or orthopedic impairments are a diverse group. Patrons using wheelchairs are considered mobility impaired, but the only accommodation they may need is the ability to slide the wheelchair under the workstation or have a chair provided that offers a safe transfer.

IBM ViaVoice Systems &
Dragon Systems,
www.dragonsys.com.

The Adaptive Technology Resource Centre contains information on all components of voice recognition at www.utoronto.ca/atrc/reference/tech/voicerecog.html.

Another patron with a mobility impairment may have experienced a stroke that limits movement to only a few fingers. For this patron, a mini-keyboard or touch pad are useful tools.

Yet another patron who is considered mobility impaired might have cerebral palsy and not have control of any limbs. This patron may need to use a head-controlled tracking device in conjunction with an on-screen keyboard.

In short, one piece of adaptive technology added to help one segment of the population might actually make access impossible for others. Libraries should have an array of hardware available that can plug in when needed.

A simple connection

The vast majority of users with mobility impairments who visit the library are those people who can benefit from a specific piece of hardware. This particular item may not be useful to any other patron in the community. But it is a lifeline to information for that patron and should be offered.

Fortunately, most of the hardware is inexpensive (\$50 to \$100). The hardware, a Y-shaped adapter plug, easily plugs into the computer's USB port. This adapter allows staff and users to change keyboards, switches, mice, and so on, without having to reboot the computer.

Diverse hardware brings empowerment

Most computer technicians are aware of ergonomic keyboards but are unaware of the variety of input devices that are available that can help patrons use their computers more productively. A few input devices follow:

- **Micro keyboard.** The micro keyboard is small and compact—about the size of a mouse pad. It enables people who have limited but controlled range of motion of their arms or hands (could be caused by arthritis, paralysis, or degenerative nerve disease) to maximize the use of their appendage without stressing it.
- **Maxi keyboard.** People with poor dexterity (could be caused by arthritis, paralysis, or degenerative nerve disease) who cannot accurately press the correct key on a standard keyboard may find an oversize keyboard helpful. The keys are four times the size of the standard key, giving the user a bigger target.
- **Switches and touchpads** allow those patrons without hand strength to gently tap the hardware device to enter information. The touchpads are about the size of that found on a laptop computer.
- **Trackball.** A trackball allows people with limited dexterity to control the cursor by using one finger, a thumb, or a palm. Trackballs may be a good choice for people with carpal tunnel syndrome as well. Specially designed trackballs, such as those by Kensington Group, offer users a larger trackball, requiring less movement by the user, which translates to less stress to the user. Commercial mouse manufacturers, such as Logitech, also make trackball devices, which help those users with less severe disabilities.

The connector is available from P.I. Engineering, www.xkeys.com/index.php.

More information about the connector's attributes, www.hp.com/hpinfo/abouthp/accessibility/partnerships/ala/lta_library_orientation_guide.pdf.

One source of micro keyboards is Solid Year at www.solidyear.com.

See a general overview of all types of keyboards at the University of Toronto's Adaptive Technology Resource Centre at www.utoronto.ca/atrc/reference/tech/altkey.html.

Large print keyboard is available from Keytronic Corp., www.keytronic.com. The actual key size is the same as a standard key.

Large key keyboards are available from Big Keys LX Keyboard at www.bigkeys.com.

Read a good discussion on alternative mouse devices at the University of Toronto's Adaptive Technology's Resource Centre, www.utoronto.ca/atrc/reference/tech/altmouse.html and www.utoronto.ca/atrc/reference/tech/switch.html.

Jelly Bean Switch,
www.ablenetinc.com

Touchpad is available from
Cirque Smart Cat
Touchpad,www.cirque.com.

Many specialized
trackballs are available
from **Kensington Group,**
www.Kensington.com, and
Logitech,
www.logitech.com/
index.cfm/products/
productlist/US/
EN,CRID=22.

An in-depth discussion of
on-screen keyboards is
available on the University
of Toronto's Adaptive
Technology Resource
Centre's website at
www.utoronto.ca/atrc/
reference/tech/
onscreen.html.

SofType is available from
Origin Instruments,
www.orin.com.

Tracker 2000 is a product
of Madentec,
www.madentec.com.

Closing the Gap, [http://
closingthegap.org](http://closingthegap.org)

**Alliance for Technology
Access,**
www.ataccess.org/hub

**The Abledata database,
University of Toronto
Adaptive Technology
Resource Centre,**
www.utoronto.ca/atrc/
reference/tech/
techgloss.html

The Ability Hub
www.abilityhub.com.

Steelcase Corp. recently
configured a module that
will accommodate all
access needs,
www.steelcase.com.

- **Joysticks.** Some people who are using motorized wheelchairs with hand controls find a joystick input device the most useful. Its movements are similar to those of the device used to control the movement of the wheelchair.
- **On-screen keyboards, pointing devices, and switches.** In instances of severe physical impairment, on-screen keyboards provide users with a method to input data. Software programs such as SofType display the keyboard on the screen, incorporate word prediction intelligence, and interface with a variety of software and hardware that allows users to move the cursor with a head movement or a slight tap of a fingertip.

The most impressive interface designed for those with severe impairments is the Tracker 2000. The hardware device rests on the computer monitor and uses infrared technology to track a reflective dot placed on the user's forehead.

The user moves his or her head from key to key, resting the laser light on a key to type. For users with some control of an appendage, a switch or touchpad that is programmed to respond to a light tap can replace the resting motion, which increases speed.

Many devices are available, and they run the gamut in price and functionality. Providing access to mobility impairments hammers home the point that people with disabilities are individuals with different expectations, goals, and needs.

Several resources explain how the devices are used as well as help staff locate the input device that offers the libraries' patrons the greatest amount of access. The most useful include Closing the Gap, Alliance for Technology Access, the Abledata database, the University of Toronto Adaptive Technology Resource Centre, and The Ability Hub.

Workstation should be accessible

Accessible computer furniture also is important. The workstation should be attractive, placed in an accessible location, and adjust to the user's needs, rather than have the user adjust to it. It should be comfortable and welcoming.

The worktable should have the ability to be raised and lowered and should have an adjustable monitor arm installed that allows low-vision patrons to pull the monitor closer to them. Also ensure a task lamp, keyboard tray, and a lockable cabinet for accessories is available. Include a sturdy ergonomic chair, too, that allows the patron to adjust height and tilt.

For library patrons with cognitive impairments

Cognitive impairments are disabilities that interfere with the ability to learn daily living tasks, communication, social skills, academic skills, and work skills at the accepted norm. Other terms used to label this group of people include developmentally delayed and intellectually disabled. Regrettably, the term *mentally retarded* is still used regularly.

Be aware that *slower* does not equal *can't*. People with cognitive disabilities may look slightly different, but they do actively participate in life.

The "Guidelines for Library Services for People with Mental Retardation" (American Library Association) challenges libraries to provide the "needed support to enable individuals to successfully use, and receive the benefit of, available services." ¹⁶

This challenge is based on three principles:

1. The library service needs of people with mental retardation cross the lifespan and the life areas.
2. Library services promote inclusion and empowerment of people with mental retardation.
3. Library services maximize access to information for people with mental retardation and their families.

Defining appropriate computer usage

Include programs to meet the needs of patrons with developmental disabilities in the adult computer training curriculum of the library.

In some cases, the use of adaptive technology is not needed. Demonstrate patience and creativity, and encourage staff to think beyond preconceived stereotypes of this group of people.

This group of patrons may be intellectually challenged, but they do hold jobs, fall in love, know about Oprah, and talk about the weather. Like the nondisabled user, train people with developmental disabilities to safely use e-mail and visit websites to increase their knowledge or just to have fun. Simply knowing how to link to the Weather Channel's website or locate their horoscope makes them part of the Internet community.

Follow these basic teaching tips for developmentally disabled patrons:

- Staff should use simple and clear language when working with this group.
- Staff should conduct the standard reference interview when deciding what types of websites the patron might wish to visit.
- Staff can help a patron recall the sites visited by sending the patron an e-mail with the hyperlinks of those visited. Staff could copy themselves or a designated person with the URLs if the patron deletes the mail.

E-mail with Best Buddies

For those worried about this fragile group being hurt by the use of e-mail (through predators, lack of response to e-mails, and so on), rest assured that e-mail can be safely taught and supported. The basic advice of "You need to be a responsible e-mail user" and "Sometimes people just do not answer e-mail" serves as a good starting point.

Best Buddies International is an organization devoted to empowering those with developmental disabilities. One of its focuses is helping people with developmental disabilities go online. To that end, it has developed a downloadable step-by-step curriculum for teaching e-mail. This thorough and thoughtful guide is available free from Best Buddies.

The e-Buddies Guide to Internet Literacy, "Learning To Use E-mail: A Curriculum for E-buddies," www.ebuddies.org/teach/guide/index.html

Sign up to be an e-Buddy or receive an e-buddy, www.ebuddies.org.

E-Buddies also helps locate an e-mail buddy for people who are willing to become involved by being responsive and vowing to answer their buddy's e-mail. The applications are screened. Best Buddies International also supports a chat room.

How AT may help

Some patrons with cognitive disabilities may benefit from some of the technologies designed for those with visual impairments. For example, individuals who do not know how to read could use JAWS to learn how to enter information into the computer (as they are able to hear the letters spoken) or read the information on the website. Other people may learn to read by using the WYNN software designed for people with learning disabilities.

Enlarged text size can help some people, too. Best Buddies provides visitors with the ability to increase text size. The Microsoft accessibility features may prove to be sufficient for most, but some may require the use of the ZoomText or MAGic screen magnification programs.

Technology for the hearing impaired

Adapting staff to think visually

Staff should be aware of the needs of patrons with hearing impairments or deafness. In most cases staff only need to adapt themselves rather than the computers to achieve accessibility. Staff should follow these guidelines:¹⁷

- When speaking with the patrons who are hearing impaired, look at them directly—they need to see your mouth move. Do not stand at an angle or in a bright light.
- Avoid talking or teaching in an area with obvious glare.
- Keep hands, glasses, pencils, and other objects away from your mouth.
- Provide plenty of printed materials to support oral conversations.
- When asked by the patron to repeat a statement, rephrase the statement, as some people with hearing impairments hear some sounds better than others.
- Use the computer to communicate. Using a word-processing program, conversations can be typed back and forth.
- Do not approach the person from behind.
- Do not raise your voice or overarticulate. Visually, both of these actions can be perceived as anger or annoyance.

Whenever possible, hire sign interpreters to provide translating services in computer training classes.

Software programs are available

When considering developing computer accommodations for people who are hard of hearing, staff need not look much further than the Microsoft Windows Accessibility option. No specific assistive technology hardware products are available for people who are deaf or hard-of-hearing. They are able to interact with computers as long as they can choose to receive information visually.

More and more websites are adding sound, which (depending on how the sound is added) may be useful for those who are blind or visually impaired; however, if a user is deaf or hard-of-hearing, that user may become information impaired.

SoundSentry—a freebie

SoundSentry allows the user to change the settings to generate visual warnings, such as a blinking title bar or a screen flash, whenever the sound is generated by the computer or an application. Microsoft provides succinct instructions for activating this option.

iCommunicator

If funding, time, and computer storage space permit, consider adding iCommunicator™ to the library's accessibility package. iCommunicator provides deaf or hard-of-hearing people with a multisensory, interactive communication device.

iCommunicator offers users real-time translation when a sign language interpreter is unavailable or when a patron does not use sign language.

The iCommunicator program efficiently converts the following in real-time:

- Speech to text
- Speech to video sign language
- Speech to a computer-generated voice
- Text to a computer-generated voice or video sign language

This capability enables staff and patrons the ability to communicate and for patrons to achieve equal access to information. The program would be useful in a classroom situation when an interpreter is unavailable or if the library is unable to pay the fee.

Something for everyone—Microsoft accessibility features

If the library cannot afford to purchase any of the previous items, be aware of the accessibility features offered in many of Microsoft's recent releases. The adjustments must be made on the individual computer, for the individual user, and requires staff to configure the needs.

This specialized configuration is a problem in libraries that only allow the specific staff to change the settings, because in most cases these staff members are either off-site or involved with work that does not allow them to make the adjustments when needed. Since the adjustments are easy and quick, public service staff can lobby to have the procedure amended to allow a willing and knowledgeable computer aide or librarian to make the adjustment for the patron.

SoundSentry, www.microsoft.com/windowsME/using/workingefficiently/tips/ao_soundsentry.asp

iCommunicator, <http://voicerecognition.com/icommunicator>

Microsoft supports a useful website that provides users with tutorials for activating and using products, www.microsoft.com/enable/products/microsoft.asp.

Although the accessibility options from Microsoft do not offer the same degree of access as the specialized packages, they do allow the user to adjust the size of the cursor and print display. Features also include accommodations for the hearing impaired and a StickyKey software program that allows the user to input a combination key command (such as CTRL-ALT-DEL) one key at a time. An on-screen keyboard also is included in the accessibility package.

Access summation

An accessible library means that the library is concerned about the entire community it serves and is committed to providing all patrons with the same opportunity to use electronic resources. Libraries that strive to provide adaptive equipment ensure their patrons have the same opportunities as notable poster children such as Whoopie Goldberg (learning disabled), Charles Schwab (learning disabled), and Christopher Reeve (physically disabled)—all of whom can afford to purchase their own equipment to compensate for their disabilities.

Notes

¹Madden, Mary. "America's Online Pursuits: The changing picture of who's online and what they do." Washington, D.C.: Pew Internet & American Life Project. 22 December 2003 (accessed Dec. 28, 2003).

²Lenhart, Amanda. The Ever-Shifting Internet Population: A new look at Internet access and the digital divide. April 16, 2003. p. 30. www.pewinternet.org.

³Section 508 requires the federal government to ensure its electronic and information technology is accessible to persons with disabilities (29 U.S.C. § 794d). www.section508.gov.

⁴Waldrop, Judith, and Sharon M. Stern. Disability Status: 2000. Census Brief Issued March 2003. U.S. Department of Commerce, U.S. Census Bureau: Washington, D.C. P. 1 www.census.gov/prod/2003pubs/c2kbr-17.pdf.

⁵*ibid.*

⁶*ibid.* p. 7. A state-by-state guide to disabilities by type can be found on the Census Bureau website.

⁷Lenhart, p. 30.

⁸Lenhart, p. 14.

⁹Umbach, Judith. "Access for All." *Feliciter*. Issue #2, 2003. p. 58.

¹⁰For example, some users may benefit from enlarging the cursor, others by adjusting the contrast level. Find detailed information at The Wide Range of Abilities and Its Impact of Computer Technology: A Research Report Commissioned by Microsoft Corporation and Conducted by Forrester Research, Inc., in 2003. www.microsoft.com/enable/research/computerusers.aspx (accessed Jan. 28, 2004).

¹¹Salmon, Amy, and Doug Anzlovar. "Enlarging the View: ZoomText and MAGic Screen-Magnification Software. Part 2. *Access World*. September 2003, vol. 4, no. 5. www.afb.org/afbpress/pub.asp?DOCID=aw040503.

¹²*ibid.* p.10.

¹³Salmon, Amy, and Doug Anzlovar. "Enlarging the View: LunarPlus Screen Magnification Program." Part 1. *Access World*. July 2003, vol. 4, no. 4. www.afb.org/afbpress/pub.asp?DocID=aw040402.

¹⁴American Foundation for the Blind "Fact Sheet: Speech Systems" www.afb.org/info_document_view.asp?documentid=1284 (accessed Jan. 21,2004), and TILE Factsheet:

Advice on Buying Equipment. Deciding what you need. www.google.com/search?hl=en&ie=UTF-8&safe=off&q=%22TILE+Factsheet:+Advice+on+Buying+Equipment%22&spell=1 (accessed Feb. 1, 2004).

¹⁵Access Ingenuity. www.accessingenuity.com/disabilities/learningDisability.htm (accessed Jan. 22, 2004).

¹⁶Standards Committee Subcommittee to Develop Guidelines for Library Services for People with Mental Retardation Guidelines for library services for people with mental retardation, Chicago: Association of Specialized and Cooperative Library Agencies, American Library Association, 1999.

¹⁷Mates, Barbara. *5-Star Programming and Services for Your 55+ Library Customers*. American Library Association: Chicago, 2003. p. 29-30.