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How Assistive Technology Has Changed the Lives of the blind and visually impaired

Abstract

This research looks at multiple ways that assistive technology has changed the lives of blind and visually impaired persons. Technology has made some major advances over the past 10 years. Although these advancements are very beneficial to most, some of these advancements create barriers for individuals who are blind or have visually impairments. These barriers make it difficult for the visually impaired to independently navigate a keyboard and desktop, a key component in today's education, employment, and the internet.

The ADA and the Rehabilitation Act of 1973 have aided in creating equal educational opportunities for the VI community. Companies such as Freedom Scientific and HumanWare provide products that assist the blind and visually impaired with the technologies of today. The American Foundation for the Blind is one of many organizations with the goal to provide programs and services to increase independence and equal opportunity. The Chicago Lighthouse has supported local employers in piloting the accommodations technique with their blind or visually impaired employees.

In Jonathan Berry's article *Apart or A Part? Access to the Internet by Visually Impaired and Blind People, With Particular Emphasis on Assistive Enabling Technology And User Perceptions*, Berry examines the effectiveness and limitations of assistive

technology. There are many social networks created to remove some of the obstacles the blind/visually impaired face when accessing certain platforms. To better understand the ways in which assistive technology has changed the lives of the blind and visually impaired community, I conducted interviews with two individuals who are blind.

Introduction

Over the past 10 years there have been major advancements in technology. From smartphones to Wi-Fi, to social networking and online streaming these technological advances have changed the way we communicate and relate to one another. Blind and visually impaired (VI) individuals typically have to rely on others for help with basic life tasks. Many blind and visually impaired persons strive to achieve true independence and self-sufficiency but lack the knowledge, information, and experience. Where do these new technologies leave those individuals who are partially sighted or blind? Organizations such as the American Foundation for the Blind (AFB), The National Federation of the Blind (NFB), and the American Council of the Blind (ACB) provide programs and services with a goal to increase independence and equal opportunities to those who are blind or have low vision. These organizations also provide resources and products such as assistive technology which aid the VI community in using the technologies of today. How has assistive technology changed the lives of the blind and visually impaired? Assistive Technology has enabled the blind and visually impaired to pursue an education, employment that they once thought was impossible, and has given them access to the World Wide Web.

Assistive technology refers to a general classification of approaches and devices that can be useful to all aspects of life. In President Bill Clinton's Assistive Technology

Act (1998), an assistive technology is defined as, "any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (Teach Thought, 2014). In other words, devices such as hearing aids, wheelchairs, walking canes, or prosthetic legs are all examples of assistive technology.

> Technology applications for education have increased dramatically in the 21st century. Computers and other technological tools now are often used in instruction for all students. Likewise, students are increasingly expected to know skills such as how to find information on the Internet, how to use audio materials for educational purposes, and how to compose essays on word processors (Johnstone, C., Altman, J., Timmons, J., Thurlow, M., & Laitusis, C., 2009).

Equally, the technological devices for students who are blind or with low vision have also increased. Title II of the ADA requires that "State and local governments give people with disabilities an equal opportunity to benefit from all of their programs, services, and activities (e.g. public education, employment, transportation, recreation, health care, social services, courts, voting, and town meetings). State and local governments are required to follow specific architectural standards in the new construction and alteration of their buildings. They also must relocate programs or otherwise provide access in inaccessible older buildings, and communicate effectively with people who have hearing, vision, or speech disabilities" (U.S. Department of Justice, 2009).

The regulations of the ADA and preceding Acts such as Section 504 of the Rehabilitation Act of 1973, have aided in creating equal educational opportunities for the VI community.

Believe it or not, blind and visually impaired students have the same academic goals as a sighted student of equal intellectual ability. When it comes to classroom instructional strategies, there have been constant challenges for those students who are

blind or have low vision. They may be able to hear lectures and discussions, but accessing class syllabi, textbooks, chalkboards or dry erase boards, PowerPoint presentations, demonstrations, transparencies, written exams, and videos can be challenging.

Much like there are different causes of blindness and visual impairment, there are also different levels of blindness and visual impairment. Some individuals have no vision, some are able to see large forms, and some have the ability to see magnified print. With a large portion of traditional education being visual, many students with visual impairments have established tactics to learn. Based on their needs, they use a range of assistive technology. These accommodations include but are not limited to taped textbooks, e-text, screen readers, screen magnifiers, closed-circuit televisions (CCTVs), large print books, and Braille materials.

Students who are blind are not able to see visual aids, printed materials, a presenter, or their demonstrations. Having audiotaped class periods, a Braille Notetaker, verbal descriptions of visual aids and demonstrations, or having the handouts in Braille, are a few ways to increase class participation of blind students. They may even have electronic course material, saved as Rich Text Format, which can be converted to speech output. Students with low vision may have a difficult time seeing visual aids, handouts, and demonstrations. Ways to gain their full participation are similar to students who are blind but also having text font enlarged, and large-print handouts and visual aids are useful methods.

To better understand the ways in which assistive technology has changed the lives of the blind and visually impaired community, I conducted interviews with two individuals who are blind. Each interviewee was asked the same questions as they addressed the use of technology based on their knowledge and experience. Michelle Visscher is a Vocational

Rehabilitation Counselor and Certified Vision Therapist for the Bureau of Blind Persons, which is a State of Michigan Department Bureau under the department of LARA (Licensing and Regulatory Affairs). Christina, (who did not feel comfortable giving her last name), is a twenty-four year old student at Saint Leo University in St. Leo, Florida. Although both Visscher and Christina are blind, they each have a different cause for their blindness. Visscher lost her vision twenty-four years ago after giving birth. This was due to a form of *Retinitis Pigmentosa* which was never formalized or diagnosed. Christina has been visually impaired since birth and has been completely blind since she was nineteen. This was due to a condition called *Familial Exudative Vitreoretinopathy* (FEVR), pronounced "fever". FEVR is a "is an inherited eye disorder characterized by premature arrest of the vascularization of the peripheral retina and significant phenotypic and genotypic variability. The disease affects full-term infants with severity ranging from absence of visual symptoms to total blindness" (Institut De La Visions, 2010).

Technology is a part of Christina's everyday life. She uses her laptop with JAWS (Job Access With Speech), BrailleNote, I-Phone, and a Slate and Stylus. *JAWS* is a screenreader which provides speech and Braille output for computer users who are unable to see screen content or navigate with a mouse (Freedom Scientific, 2014). *BrailleNote* is a computer made by HumanWare for individuals with visual disabilities. Its features include a braille keyboard, speech synthesizer, and a refreshable Braille display. "A *slate and stylus* is to a braille reader what a pen or pencil is to a print reader. Just as the pen or pencil is designed to place a visible mark on a piece of paper, the slate and stylus is designed to emboss raised, tactile bumps or dots onto paper" (American Foundation for the Blind).

Even though it was in the 80's that technology began making it possible for the blind and visually impaired to use computers, many people are still unaware that blind

people are able to and actually use computers. When asked what she felt has been the best development for the blind and visually impaired in the last decade, interviewee Christina replied, "Computer Technology." She went on to say, "Without computer technology we couldn't use the computer, an interval part of everything…Facebook, social media. Everything is so technology based. I wouldn't be able to go to school without it." These statements demonstrate that with today's advancements in technology, people of the blind and visually impaired community are capable of doing everything on a computer that a person with sight can.

Outside of computer operation, the blind and visually impaired are also capable of performing almost any vocation. From a lawyer to an artist, day care worker, customer service representative, salesperson, food service worker, secretary, accountant, financial analyst, factory worker, teacher, computer programmer, counselor, and more, the possibilities are countless. People who are blind and visually impaired have a broader range of career opportunities because of the passage of the Rehabilitation Act of 1973, the ADA, and a combination of other events.

For decades, The Chicago Lighthouse has supported local employers in piloting the accommodations technique with their blind or visually impaired employees (The Chicago Lighthouse, 2014). The goal of an accommodation is to allow a qualified worker to function at his or her best level by decreasing the effect of a disability on his or her job performance, not by giving special treatment. In other words, workplace accommodations decrease or remove workplace barriers (The Chicago Lighthouse, 2014).

> "Accommodations are adjustments to the work environment or an individual's work situation that enable a person with disabilities to perform work duties as well as (but not always in the same way) his or her co-workers without disabilities. Accommodations that have proven effective and affordable for workers with visual impairments include the following:

- Glare reduction and adjusted lighting.

- Voice or e-mail messages instead of handwritten notes

- Desk or laptop computers adapted with screen-reading (synthesized speech), screen magnification, and/or optical character recognition (OCR) software.

- Scanners, larger-than-average monitors, and/or braille display devices can be added as peripherals.

- Large print, tactile, or talking calipers, scales, tape measures, thermometers, blood pressure cuffs, calculators, money identifiers, and cash registers" (American Foundation for the Blind, 2014).

Impaired users have the ability to perform computer tasks through workplace accommodations and other assistive technologies. In the same way that most people are unaware that visually impaired persons use computers, some visually impaired are unaware of the assistive technologies that enable them to use computers. In Mandira Banerjee's article *Technology changing lives for visually impaired people in developing countries*, Banerjee records the findings of Joyojeet Pal's study, surveying 176 people in India. The article begins speaking about a man who "was planning to be a lawyer because he didn't think visually impaired people like him could do high-tech jobs in India. After discovering special technology that allows him to use computers, he changed his mind and now wants to be a software engineer" (Banerjee, 2014). This is one of many examples of the confidence that assistive technology has given people of the VI community.

In my phone interview with Visscher, I learned that she uses technology every day for work and organizations that she is a part of. "I use technology to make newsletters, sending out info, and communications" (Visscher, 2014). She is able to perform these duties independently with the screen reader, JAWS. Visscher is an advocate and supporter whose passion is to make communities accessible for individuals who are blind or have

visual impairments. Visscher is also the president of Visually Impaired Persons for Progress and a member of the Michigan Association of Educators and Rehabilitation Instructors.

On October 25, 2007, Visscher received the Michigan Rehabilitation Association (MRA) Job Placement Division (JPD) Placement Specialist of the Year Award at the MRA/JPD at Devos Place in Grand Rapids, MI. This is an annual award presented to the person who excels in assisting persons with disabilities in gaining employment, staying employed, and advancing in their employment. Visscher has excelled in all of these in her work with the Michigan Commission for the Blind (MCB), serving people who are blind and visually impaired in Kent and Muskegon counties.

Other than educational and employment goals, assistive technology also plays a huge role in internet accessibility for the blind and visually impaired. As the internet is growing it is progressively changing the way people perform everyday responsibilities. Many duties that were mainly completed through personal interaction can now be done online (e.g. shopping, banking, paying bills, investing, and searching for jobs or housing). According to the Royal National Institute for the Blind (RNIB), "the internet is one of the most significant developments since the invention of Braille… [because] for the first time ever many blind and partially sighted people have access to the same wealth of information as sighted people and on the same terms" (as cited by The Australian Library Journal, 2001, p. 161). For instance, the blind and partially sighted are able to read the news, correspond or send emails, check the weather, read online books or documents, access dictionary or other reference materials, retrieve travel information, and enjoy an array of entertainment options.

While assistive technology has proven to be effective, there are some limitations. Jonathan Berry, an Assistant Information Specialist, conducted a survey in his article, *Apart or A Part? Access to the Internet by Visually Impaired and Blind People, With Particular Emphasis on Assistive Enabling Technology And User Perceptions*. The survey was intended to record how a particular group of visually impaired students interpret the web as a "digital Information environment" and to determine the variances in use among blind and partially sighted users (Berry, 1999). Berry examined many subjects throughout his text, one of which was the Effectiveness and Limitations of Assistive Technology. "Although screen reading technology has improved dramatically recently, it is not an optimal method for using the Web as it is a "bolt-on" extra, rather than being designed into products from the beginning" (Berry, 1999). Typically, new technology advancements means software updates, which can result in compatibility issues of the screen reader technology and the latest software. The movement to make Web pages more graphic and complex makes it extremely difficult for screen reader technology to successfully notify users of a Web page's content, identify choice options, and evaluate the source (Berry, 1999).

Another subject Berry examined in his text was Good Web Page Design. A well-structured design will not only increase the number of sites that visually impaired individuals are able to access, but it also makes the experience more enjoyable for blind users. The users will be less frustrated and equality will rise as access becomes more operative. It is not just the visible screen components that make a good design, but also the structure, descriptive and informative text labelling, and the use of refined programming languages to integrate visually impaired users with the mainstream (Berry, 2009).

"Inaccessibility of webpages directly impacts the education of the print-disabled…Even today, when technology is in a very advanced stage, websites exist that cannot be read by a screen reading software" (Tripathi, 2004, p. 26). In order to access the internet blind/visually impaired individuals must have a web browser that works well with a screen reader. Internet explorer is the most user friendly browser for the VI community and it works sufficiently with an assortment of screen readers (Spencer K. L., 2001, p. 30). *JAWS* is known as the world's most popular screen reading software but there are other screen readers such as *Thunder* by screenreader.net, *Windows Eyes* from GW Micro, *Dolphin Supernova* by Dolphin, *System Access* from Serotek, *ZoomText Magnifier/Reader* from AiSquared, and NVDA (open source).

"Not only does access to the internet increase access to information for people who are blind or have vision impairments, but it also allows them to participate in a new information and communication format which has the potential to become a primary source for all people" (The Australian Library Journal, 2001, p. 169). When thinking of a new information and communication format, two words come to mind, *social media*. *Social media* "is a broad term used to describe different types of web based services and mobile applications that enable people with common interests to communicate and share information and resources with each other in real time" (Action for blind people, 2014).

Action for the blind lists four types of social media that are used for separate purposes: social networking, social bookmarking, social referral, and micro blogs.

- Social networking sites (Facebook, MySpace, and LinkedIn) allow people to connect with those they choose to, by invitation.
- Social bookmarking tools (Delicious) allow people to bookmark web pages they like and share these with others.
- Social referral tools (Digg and StumbleUpon) are like online popularity contests. People denote web pages they like and the more people who like them, the better ranking the web page gets.

- Micro blogs (Twitter) allow people to convey their ideas, link to websites, share pictures and communicate with one person or all people with a limited number of characters. Twitter messages, called Tweet, must be 140 characters or less (Action for blind people, 2014).

Action for the blind is one of many sites that provide a variety of services, resources, and information that help and support the blind and visually impaired community.

According to AFB AccessWorld Magazine, there are "fundamental ingredients" for accessing such networks as LinkedIn, Facebook, and Twitter. The selection of a concrete browser is essential to desktop social networking access. "Internet Explorer 10, Mozilla Firefox 20, and Apple's Safari 6.03 are exceptional options that present information in slightly different ways" (AFB Access World Magazine, 2013). A considerable amount of this information is contingent upon the mode your desired screen reader cooperates with these browsers. AFB AccessWorld Magazine lists JAWS for Windows 14 and Window-Eyes 8.1 as "fantastic compliments" to Internet Explorer or Firefox. For those that use Safari on a Macintosh, VoiceOver 4 provides pleasant alternatives (AFB Access World Magazine, 2013).

Among a few of the access barriers the blind and visually impaired face when accessing social networks, are visual verification tools like CAPTCHA. A CAPTCHA is "a program that protects websites against bots by generating and grading tests that humans can pass but current computer programs cannot" (CAPTCHA.net, 2000-2010). In other words, the program is designed to automatically tell the difference between humans and computers. CAPTCHA is a technology that produces random letters and words that users must enter to verify that they plan to sign up for the site or publish particular content (InsideFacebook, 2009). Facebook uses CAPTCHA as a method to avoid spam.

Aside from CAPTCHA, there are the many photos shared from user to user. Blind users typically miss out on the content of the photos, unless Facebook users write descriptive captions. Visscher also mentioned pop-up blockers and how they pose issues as well. With that being said, Facebook has worked with the American Foundation for the Blind (AFB) to make the social network more accessible to those with visual impairments, according to AFB's president and CEO, Carl Augusto (InsideFacebook, 2009). *Making Facebook Accessible for Everyone* is a Facebook guest blog post published by Augusto on April 6, 2009. Part of that blog post reads: …One of AFB's priorities is broadening access to technology, and AFB is working together with Facebook to make the site more accessible and user-friendly for people who are blind or visually impaired (Facebook, 2009).

So far, Facebook has helped the blind or visually impaired users in the following ways:

1) Facebook has provided an audio CAPTCHA, which allows a user with a screen reader to access the site.
2) Because screen readers don't handle web pages with more advanced computing codes as well, Facebook has a full HTML version of the site (which is the same as its mobile site: http://m/facebook.com).
3) Facebook's Gift Shop has "no javascript" version.
4) Facebook enables Facebook Chat to work with screen readers (using the pop-out function).
5) Facebook has several shortcut keys to navigate to key areas of the site, such as the Home page and Profile (InsideFacebook, 2009).

Facebook is one of the most popular networking sites. It has become a way of life with people accessing it daily.

There are many social networks created to remove some of the obstacles the blind and low vision persons face when accessing certain platforms. audioBoom is an audio

focused social network with a goal to help blind people in connecting with others "in a way that has not been possible before" (audioBoom, 2014). Unlike traditional blog sites, audioBoom allows users to audio blog. It also enables certain functions on smartphones and tablets, such as voice over and screen reader, which then allows the blind and low vision users to use the audioBoom app easily. Inclusive Planet is a website based out of Bangalore that allows persons with visual disabilities to easily share information and content in such formats that are screen-reader friendly. Inclusive Planet has become the social web for the site impaired. "Its members (or Planeteers) make new friends online, and interact socially" (Dutiee, 2011). I-MerSee and Zone BBS are two other social networks available for the blind and visually impaired.

Assistive Technology has created computer and internet accessibility for the blind and visually impaired. With a variety of tools, assistive technology has made a highly visual environment accessible to those unable to see or who have trouble seeing a computer screen. Although there are still some obstacles that the blind and visually impaired communities are faced with when trying to gain access to particular computer software and web content; there are technological advancements being made to remove these barriers. Screen readers, screen magnifiers, and speech recognition software are just a few high-tech devices that increase the independence of the VI community. With these tools they have the confidence to pursue educational and employment options they once thought they did not have. Marcia Scherer describes how assistive technology has "contributed significantly in the attempts of leveling the social, academic and professional fields for blind and visually individuals" (as cited in Tripathi, 2004, p. 1). "At least speech software has given people a choice. It's a godsend…It's leveled the playing field"

(Visscher, 2014). With assistive technology the blind and visually impaired are no longer apart from the visual world of technology but a part of it.

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How has Assistive Technology Changed the Lives of the Blind and Visually Impaired

By Chakila L. Hoskins

What is Assistive Technology (AT)?

In President Bill Clinton's Assistive Technology Act (1998), it was **defined in a way** that is consistent with the development and use of assistive technologies around the world:

> "Any item, piece of equipment, or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. AT service is directly assisting an individual with a disability in the selection, acquisition, or use of an assistive technology device."

Technology for education

"Technology applications for education have increased dramatically in the 21st century. Computers and other technological tools now are often used in instruction for all students. Likewise, students are increasingly expected to know skills such as how to find information on the Internet, how to use audio materials for educational purposes, and how to compose essays on word processors" (Johnstone, C., Altman, J., Timmons, J., Thurlow, M., & Laitusis, C., 2009).

Technological Devices for the VI Community have increased

Title II of the ADA requires that "State and local governments give people with disabilities an equal opportunity to benefit from all of their programs, services, and activities (e.g. public education, employment, transportation, recreation, health care, social services, courts, voting, and town meetings). State and local governments are required to follow specific architectural standards in the new construction and alteration of their buildings. They also must relocate programs or otherwise provide access in inaccessible older buildings, and communicate effectively with people who have hearing, vision, or speech disabilities" (U.S. Department of Justice, 2009).

Example of Assistive Technology

- Hearing aids

- Wheelchairs

- Walking cane

- Prosthetic leg

Challenges for Low Vision or Blind students

Although they may hear class lectures or discussion, they may experience difficulties accessing:

-syllabi, textbooks, chalkboards or dry erase boards, PowerPoint presentations, demonstrations, transparencies, written exams, and videos

Solutions

- Taped textbooks
- e-text
- screen readers
- screen magnifiers
- closed-circuit televisions (CCTVs)
- large print books
- Braille materials.

Other Examples of Assistive Technology for VI students

- Speech Recognition Software
- Text-to-speech software
- Visual Aids
- Audio Aids
- Physical Aids

Braille Notetaker

JAWS- Job Access With Speech

- "...JAWS is my eyes. I've been using JAWS since 2001, and it has helped me wonders, right through my educational period at college up till now in my professional life as a computer instructor to blind learners..." Salman Khalid - Lahore, India

JAWS in action
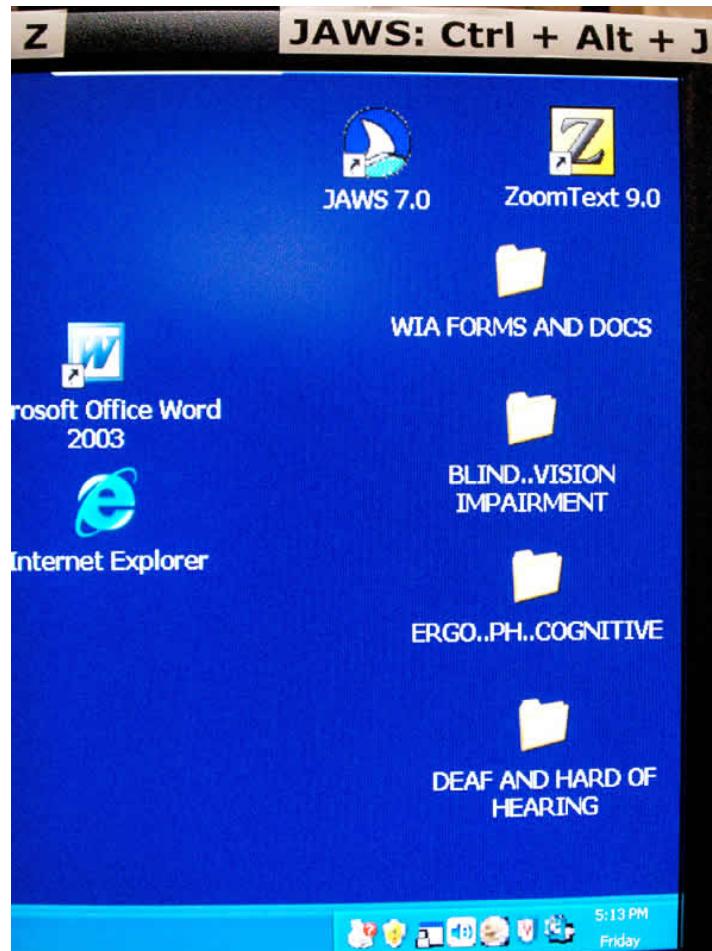
JAWS shortcuts

List of shortcuts in this document:

- JAWS COMMANDS FOR READING TEXT
- JAWS NAVIGATION - INFORMATION KEYSTROKES
- JAWS KEYSTROKES FOR CURSORS AND MOUSE SIMULATION
- MISCELLANEOUS JAWS KEYSTROKES
- JAWS KEYSTROKES FOR ACCESSING HELP
- GENERAL WINDOWS KEYBOARD COMMANDS
- GENERAL WINDOWS APPLICATION KEYSTROKES
- WINDOWS KEYSTROKES FOR WORKING IN DIALOG BOXES
- WINDOWS KEYSTROKES FOR WORKING WITH TEXT
- MICROSOFT WORD STANDARD KEYBOARD COMMANDS

Screen reader users learn many keyboard shortcuts to work more efficiently because they use touch typing. They listen to all text on a page and hear their navigation options.

- JAWS COMMANDS FOR READING TEXT

Say Character - Num Pad 5
Say Prior Character - Left Arrow
Say Next Character - Right Arrow
Say Character Phonetically - Num
Say Word - Insert+Num Pad 5
Say Prior Word - Insert+Left Arro
Say Next Word- Insert+Right Arro
Select Prior Word - Shift+Insert+
Select Word – Control+Shift+Rig
Spell Word - Insert+Num Pad 5 P
Say Line - Insert+Up Arrow
Say Prior Line - Up Arrow

These two samples are from JAWS cheat sheets.

Say Word - Insert+Num Pad 5
Say Prior Word - Insert+Left Arrow
Say Next Word- Insert+Right Arrow
Select Prior Word - Shift+Insert+Left Arrow
Select Word – Control+Shift+Right Arrow
Spell Word - Insert+Num Pad 5 Pressed Twice Quickly
Say Line - Insert+Up Arrow
Say Prior Line - Up Arrow
Say Next Line - Down Arrow
Say Sentence - Alt+Num Pad 5
Say Prior Sentence - Alt+Up Arrow

Freedom Scientific Products

Screenreader

supporting blind and visually impaired users

Our mission is to improve the lives of blind and partially-sighted people.

We make the computer and the smartphone talk or easier to see. Being able to read, write and learn = a fuller life.

http://www.screenreader.net/index.php?pageid=4

- Talking computer products

- Magnifying glass

- Braille and audio manual

- Products for Braillists
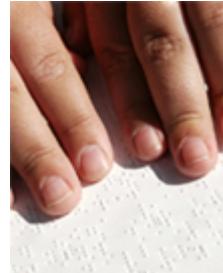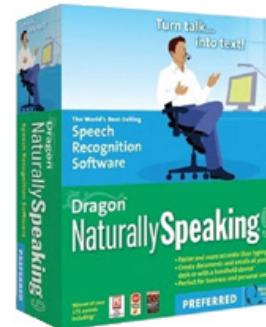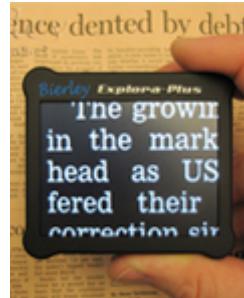
- ## WebbIE

  We make access to the web free and easy for blind and partially sighted people.

- ## Thunder

  Computer Success with Thunder is for anyone wanting to learn how to use a computer without sight.

- ## Georgie

  Georgie is much more than a phone with big bright icons and speech feedback.

'"I use Thunder to make my PC talk to me and WebbIE to enjoy the internet. GeorgiePhone is great whenever I travel. Now I train other visually impaired people to get the best out of this technology'" -Stephanie (totally blind and very able.)

http://www.nei.nih.gov/resources/strategicplans/neiplan/frm_impairment.asp

Accommodations of the Workplace

- Glare reduction and adjusted lighting.

- Voice or e-mail messages instead of handwritten notes

- Desk or laptop computers adapted with screen-reading (synthesized speech), screen magnification, and/or optical character recognition (OCR) software.

- •Scanners, larger-than-average monitors, and/or braille display devices can be added as peripherals.

- •Large print, tactile, or talking calipers, scales, tape measures, thermometers, blood pressure cuffs, calculators, money identifiers, and cash registers" (American Foundation for the Blind, 2014).

Assistive Technology and the Internet

Many duties that were mainly completed through personal interaction can now be done online.

e.g. shopping, banking, paying bills, investing, and searching for jobs or housing

Limitations of the Internet

Typically, new technology advancements means software updates, which can result in compatibility issues of the screen reader technology and the latest software.

The movement to make Web pages more graphic and complex makes it extremely difficult for screen reader technology to successfully notify users of a Web page's content, identify choice options, and evaluate the source (Berry, 1999).

Good Web Page Design

- A well-structured design will not only increase the number of sites that visually impaired individuals are able to access, but it also makes the experience more enjoyable for blind users.

- "Inaccessibility of webpages directly impacts the education of the print-disabled…Even today, when technology is in a very advanced stage, websites exist that cannot be read by a screen reading software" (Tripathi, 2004, p. 26).

Social Media

- Action for the blind lists four types of social media that are used for separate purposes: social networking, social bookmarking, social referral, and micro blogs.
- **Social networking** sites (Facebook, MySpace, and LinkedIn) allow people to connect with those they choose to, by invitation.
- **Social bookmarking** tools (Delicious) allow people to bookmark web pages they like and share these with others.
- **Social referral** tools (Digg and StumbleUpon) are like online popularity contests. People denote web pages they like and the more people who like them, the better ranking the web page gets.
- **Micro blogs** (Twitter) allow people to convey their ideas, link to websites, share pictures and communicate with one person or all people with a limited number of characters. Twitter messages, called Tweet, must be 140 characters or less (Action for blind people, 2014).

Barrier of Social Media for the Blind
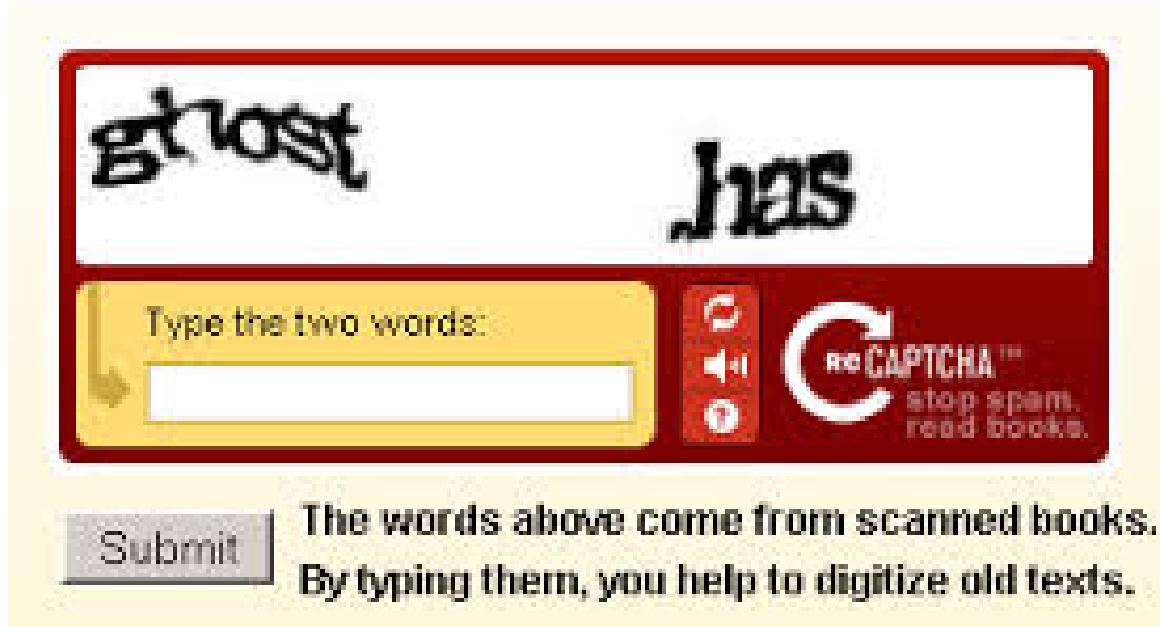
Facebook works with the American Foundation of the Blind combination

So far, Facebook has helped the blind or visually impaired users in the following ways:

- Facebook has provided an audio CAPTCHA, which allows a user with a screen reader to access the site.
- Because screen readers don't handle web pages with more advanced computing codes as well, Facebook has a full HTML version of the site (which is the same as its mobile site: http://m/facebook.com).
- Facebook's Gift Shop has "no javascript" version.
- Facebook enables Facebook Chat to work with screen readers (using the pop-out function).
- Facebook has several shortcut keys to navigate to key areas of the site, such as the Home page and Profile (InsideFacebook, 2009).

Social Networking for the Blind and Visually Impaired

- audioBoom

- Inclusive Planet

- I-MerSee

- The Zone BBS

"At least speech has given people a choice....it's a God sent. It's leveled the playing field." – Michelle Visscher, (Vocational Rehabilitation Counselor of the Bureau Services for Blind Persons-State of Michigan Department)

A part or Apart?

"A part=union
Apart=seperation "