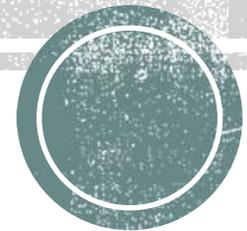


Assistive Technology in Education

Dr. Sanjay Kumar Pandagale

Associate Professor in Education

Regional Institute of Education, NCERT, Bhopal



- ❖ **Assistive technology** is an umbrella term that includes assistive, adaptive, and rehabilitative devices for people with disabilities.
- ❖ It promotes greater independence by enabling people to perform tasks that they were formerly unable to accomplish, or had great difficulty accomplishing, by providing enhancements to, or changing methods of interacting with, the technology needed to accomplish such tasks.

Classification

- ✓ Mobility impairment,
- ✓ Visual impairment,
- ✓ Hearing impairment,
- ✓ Cognitive impairment.



Mobility impairment

* Wheelchairs

Wheelchairs are devices that can be manually or electrically propelled and that include a seating system and are designed to be a substitute for the normal mobility that most people enjoy. Wheelchairs and other mobility devices allow people to perform mobility related activities of daily living which include feeding, toileting, dressing grooming and bathing.



Visual impairment

Light or Low Assistive tech for individuals with visual impairments include-

- Braille
- Magnifying glasses
- Large print text/books
- Anti-glare paper
- Contrasting text and background colors
- Thick lined paper
- Reading/writing stand
- Optical magnifier
- Highlighters
- Felt tip markers with various thicknesses
- slant board
- Color filters



*Screen readers

Screen readers allow the visually impaired to easily access electronic information. These software programs connect to a computer to read the text displayed out loud.

✓The most popular commercial screen readers include

[JAWS](#)

[Window-Eyes](#)

[Supernova Screen Reader.](#)

[NVDA](#)

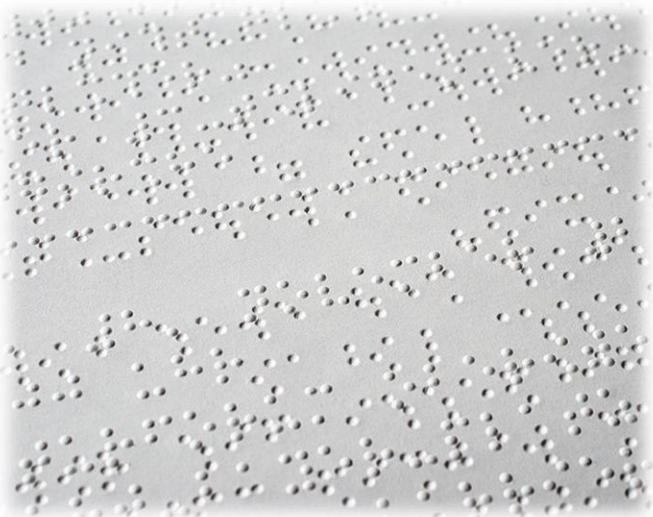
[Thunder](#)

[System Access to Go](#)



*Braille and braille embossers

Braille is a system of raised dots formed into units called braille cells. People can then use their fingers to read the code of raised dots. A braille embosser is a printer for braille. Instead of a standard printer adding ink onto a page, the braille embosser imprints the raised dots of braille onto a page. Some braille embossers combine both braille and ink so the documents can be read with either sight or touch.



BRAILLE Alphabet

A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	
.	,	?	!	'	-	CTRL	#	0
1	2	3	4	5	6	7	8	9



Mid Assistive tech for individuals with visual impairments include -

- Large key keyboards
- Keyboards with high contrast
- MP3 players to record lectures/notes
- Light box - used with students to train their visual acuity
- Audio books
- Books in alternative formats
- Portable word processing device
- Large key calculator



Large key keyboard



Mp3 players for the VI person

The device is laid out similarly to a large mobile phone, complete with a numerical keypad and dedicated volume buttons on the side.



High contrast keyboard



Audio books

If you search for audio book websites then you will find number of sites for free audio books. One such site is <http://www.loyalbooks.com/>



There are several types of alternative formats that books can be displayed in for individuals with a visual impairment. Check out these sites-

Learning Ally (formerly RFB&D): www.learningally.org

Bookshare: www.bookshare.org

LibriVox: www.LibriVox.org

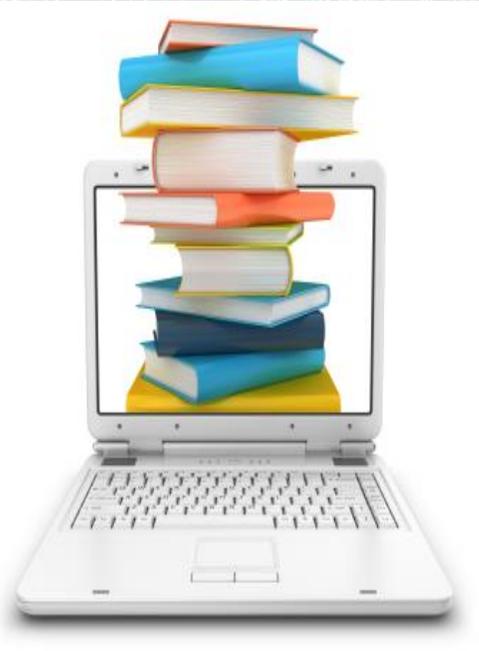
Project Gutenberg: www.gutenberg.com

Inkling: www.inkling.com

Louis Database of Accessible Materials, American Printing House for the Blind: www.loius.aph.org

National Library Service for the Blind and Physically Handicapped: www.loc.gov/nls/

Google eBooks: <http://books.google.com/ebooks>

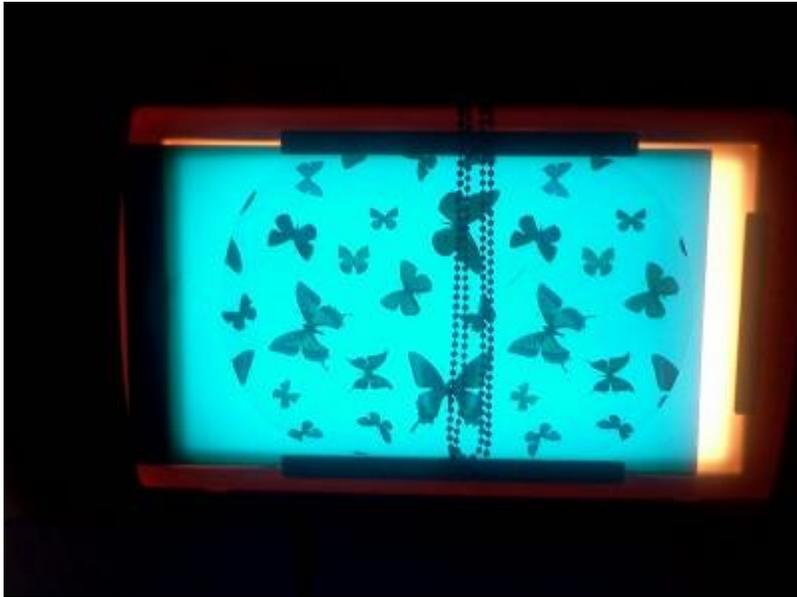


Books in alternative formats





A lightbox is a piece of equipment that lights a see through plastic piece of paper. It can also illuminate clear shapes, colors, and objects.



Light box



Portable word processing device



A **portable word processor**, often called a **portable keyboard**, is a lightweight device that is an alternative to using a laptop for writing. It can be easily transported from class to class and between home and school.

Large key calculator



High Assistive tech for individuals with visual impairments include -

- Screen magnification
- Reading machines
- Video magnifiers
- Refreshable Braille displays
- Braille translation software
- Note taker recognition
- Mobile devices



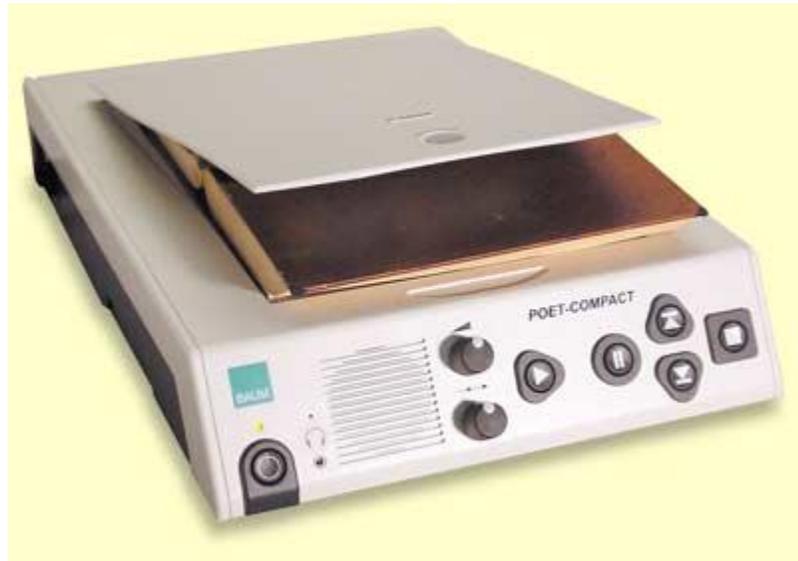
Screen magnification

- A screen magnifier is a tool that can magnify everything (text, photos, graphics, etc) on a computer or a mobile device screen.
- Screen magnifiers can sometimes include extra features such as:
 - ✓ Contrasting background and text colors
 - ✓ Mouse pointers and cursors can be enhanced
 - ✓ Some can even do basic screen reading functions
- Most recent computer running Windows, Mac OS or Linux have a screen magnifier built into them.
- Some common screen magnifiers for Windows computers include:
 - [ZoomText](#)
 - [MAGic](#)
 - [Supernova Screen Magnifier](#)
- Start the screen magnification function from the control panel



Reading machines

- A reading machine utilizes a camera or a scanner with Optical Character Recognition (OCR) software.
- Basically it turns a printed document into electronic text.
- This text can then be relayed to a screen to read in large print or read aloud by a screen reader.



Video magnifiers/ CCTV

- A CCTV is an aid that uses magnification and it is made of a camera and a monitor.
- The magnification level is much greater than for a hand magnifier



Refreshable Braille displays

- A braille display is used with a screen reader to output screen information in a tactile form.
- It consists of a number of cells which have eight pins which can be moved up and down to form braille characters.



Braille translation software

- Braille translation software can be used to convert an electronic document, such as one in Microsoft Word into braille.
- The result can then be printed by an embosser, which is a printer that uses pins to indent the dots onto paper.

Voice Recognition Software

- Voice recognition provides an alternative way to control or input information to a computer or mobile phone.
- You talk to the computer or phone and what you say is interpreted as commands or converted to electronic text.
- Google assistant is the best example.



Hearing impairment



❖ Captioning

Captioning allows spoken word on the television to be translated into typed English or other language for the viewer to read.

❖ **Live Speech Captioning:** in this process, a stenographer types the spoken language as teacher talks and text is displayed on computer monitor.



Cognitive impairment

Assistive technology for cognition (ATC) is the use of technology (usually high tech) to augment and assistive cognitive processes such as attention, memory, navigation, emotion recognition, management, planning, and sequencing activity.

*Educational software

Educational software is a software that assists people with reading, learning, comprehension, and organizational difficulties. Any accommodation software such as text readers, notetakers, text enlargers, organization tools, word predictions, and talking word processors falls under the category of educational software.



Other assistive mobile apps

- Google translate
- Microsoft translator
- Speech Texter
- Keep Notes



Resources

- **Web Resources for Assistive Technology in the Classroom** <http://www.sc.edu/scatp/ATclassroom.htm>

This website offers a variety of resources that can be useful in learning more about assistive technology and its use in the classroom. I have included a few of its listed websites and the description of those websites below. Others may be found by logging on to the address above.

- **The Power of Assistive Technology** by Janet Jendron, South Carolina Assistive Technology Program Overview of the common uses of assistive technology in the classroom. <http://www.connsensebulletin.com/jendron.html>

- **Assistive Technology and Learning Disabilities** by Janet Jendron, South Carolina Assistive Technology Program. This article includes an overview of various hardware, software and low tech tools for students and teachers with a focus on literacy and a mention of available math tools. While there is an emphasis on middle and high school, many of the tools described are useful for elementary school students. <http://www.sc.edu/scatp/ld.htm>

- **"NEW" Freeware, Shareware and Demo Programs on the Internet.** Reprinted in the ConnSENSE Bulletin (www.connsensebulletin.com) from the Butte, Montana Office of Education, this is a 9/04 document that lists freeware and shareware off the Internet in the following categories: Cursors, Demos, Drawing, Coloring and Creating programs, Educational Games and Programs, E-Text, Graphics, Graphic Organizers, Internet sites, Keyboarding, Math Support, Modification Checklists, Mouse Skills, On-Screen Keyboards, Sign Language, Symbol Support, Text-To-Speech, Tools and Visual Support

<http://www.connsensebulletin.com/freeware05.pdf>

<http://www.connsensebulletin.com/freeware.html>

<http://www.sc.edu/scatp/ATclassroom.htm>



- **The National Center to Improve Practice (NCIP)** was funded by the U.S. Department of Education, Office of Special Education Programs from 1992-1998 to promote the effective use of technology to enhance educational outcomes for students with sensory, cognitive, physical and social/emotional disabilities. The NCIP Library has a wealth of information about technology, disabilities, practice, and implementation. They also offer an outstanding series of video profiles that vividly illustrate how students with differing disabilities use a range of assistive and instructional technologies to improve their learning. Each video, approximately 10 minutes in length, is accompanied by supporting print materials that explore topics more fully. Their online tour of two exemplary early childhood classrooms show practical uses of AT.
<http://www2.edc.org/NCIP/>
- **"Web Toolboxes for Educators,"** compiled by Dr. Cheryl Wissick at the USC College of Education, this alphabetical listing of terrific educational resources can serve as a starting point on your search of the Web, provide interactive activities, informational resources, and lessons; and help with the integration of technology in education. One section of this web site would be of particular interest to special educators, with links for software related to web access, talking word processes, text-to-speech tools, found at
<http://www.ed.sc.edu/caw/toolboxsource.html>
<http://www.ed.sc.edu/caw/toolboxvendors.html>
- **Cool Assistive Technology Tools for the Classroom:** Also compiled by Janet Jendron of SCATP.
<http://www.sc.edu/scatp/cooltools.htm>
- The **South Carolina Assistive Technology Program's** Web site is at <http://www.sc.edu/scatp>
- **Assistive Technology | Helping Challenged Kids Get the Most from Learning**
http://www.educationworld.com/a_tech/tech/tech086.shtml
- **Tools for Life: Learning Disabilities Guide** <http://www.gatfl.org/LearningDisabilitiesGuide.aspx>

This is an excellent website showing how assistive technology can help in the classroom. It is also a good source to help in selecting the specific technology needed for students.



- **Assistive technology for kids with LD: An Overview**

<http://www.greatschools.org/special-education/assistive-technology/702-assistive-technology-for-kids-with-learning-disabilities-an-overview.gs> This site offers a wealth of information on a variety of assistive technology tools.

- **The Georgia Project for Assistive Technology: Resources** www.gpat.org/

This page offers information on assistive technology definition, devices, legal mandates, considerations, implementation and integration, evaluation, policies and procedures.

- **National AT Advocacy Project** www.nls.org/natmain.htm

This site contains a booklet that focuses on the rights of students in public schools to have the help of assistive technology. It is ideal for advocates and others that work with disabled children. It offers a wealth of information concerning IDEA and section 504 and how the law affects the availability and use of assistive technology in the classroom, today.

- **AbilityNet GATE: Global Assistive Technology Encyclopedia** <http://abilitynet.wetpaint.com>

- **Assistive Technology from Wikipedia** http://en.wikipedia.org/wiki/Assistive_technology

- **Assistive Technology in Education: A Guide for the Delivery of Assistive Technology Services for Students with Disabilities** <http://www.atp.ne.gov/techassistdoc.html>

- **Hearing Assistive Technology** http://www.asha.org/public/hearing/treatment/assist_tech.htm

- **N_A_T_E_ Network Site** <http://www.natenetwork.org/>

- **[Accessibility features of android mobile device](#)**

- **[Web Accessibility Features](#)**



Thank you!

