



# Online Training on “Inclusive Education and Digital Technology”

Organized by Central Institute of Educational Technology, NCERT  
in collaboration with Department of Education of Groups with Special Needs, NCERT

## Day 4: Assistive Technologies

**Presented by**

Dr. R. Shilpa Manogna,  
Associate Professor,  
DEGSN, NCERT

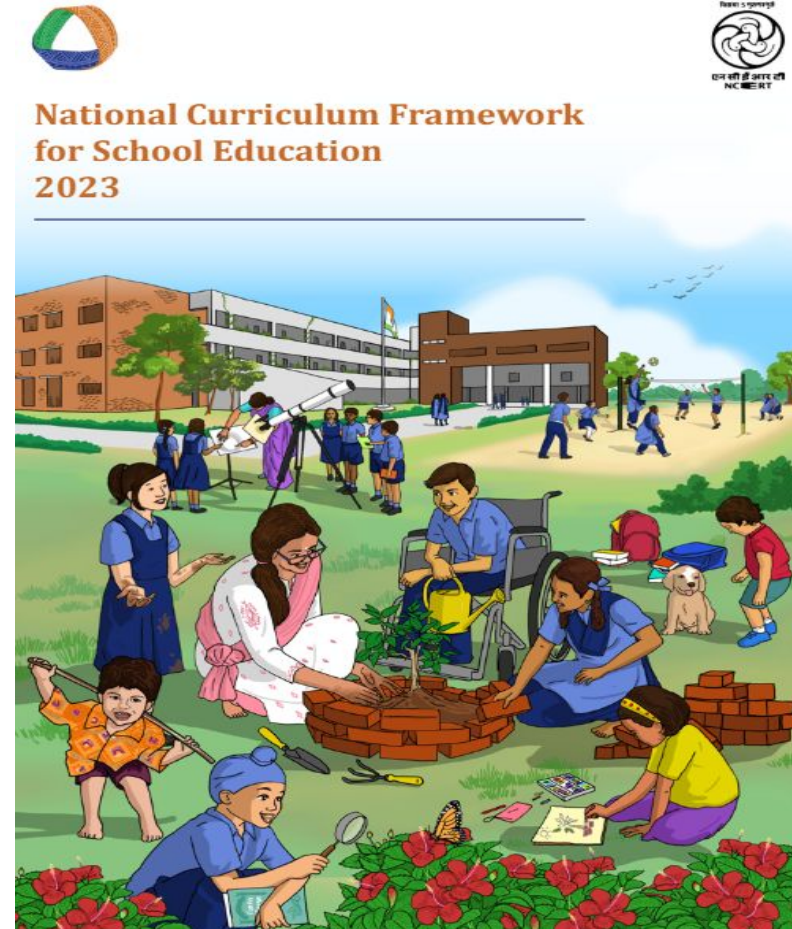
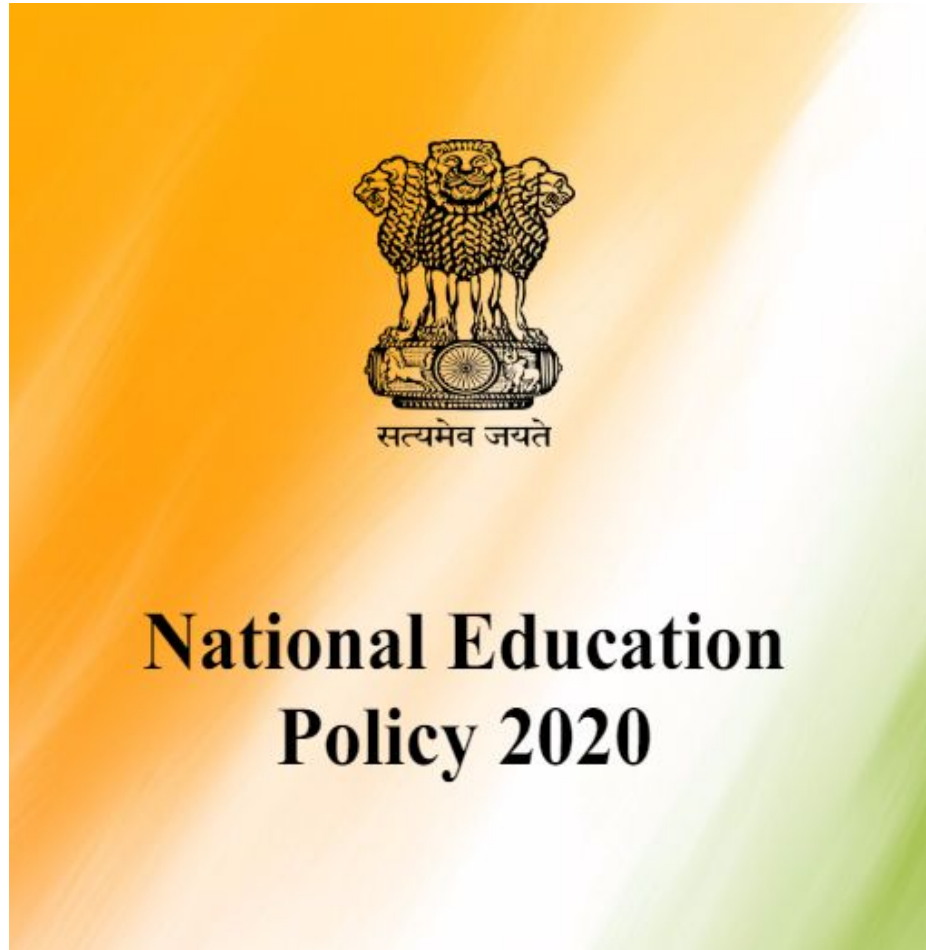


# DISCUSSION POINTS

- ✓ Understanding Key Terms: Assistive Technologies, Aids and Assistive Devices
- ✓ Policy Perspectives on Assistive Technologies(AT)
- ✓ Categories of AT
- ✓ Benefits of AT
- ✓ Few Examples
- ✓ Where & How to avail them?
- ✓ Challenges and Future Trends



# WHAT DOES THE POLICY SAY?



# NEP 2020 - SEDGs



# DEFINITIONS

## WHO definitions

*Assistive technology* is the application of organized knowledge and skills related to assistive products, including systems and services. Assistive technology is a subset of health technology.

An *assistive product* is any external product (including devices, equipment, instruments or software), especially produced or generally available, the primary purpose of which is to maintain or improve an individual's functioning and independence, and thereby promote their well-being. Assistive products are also used to prevent impairments and secondary health conditions.

*Source:* Priority assistive products list. Geneva: World Health Organization; 2016 (<https://www.who.int/publications/i/item/priority-assistive-products-list>, accessed 20 April 2022).

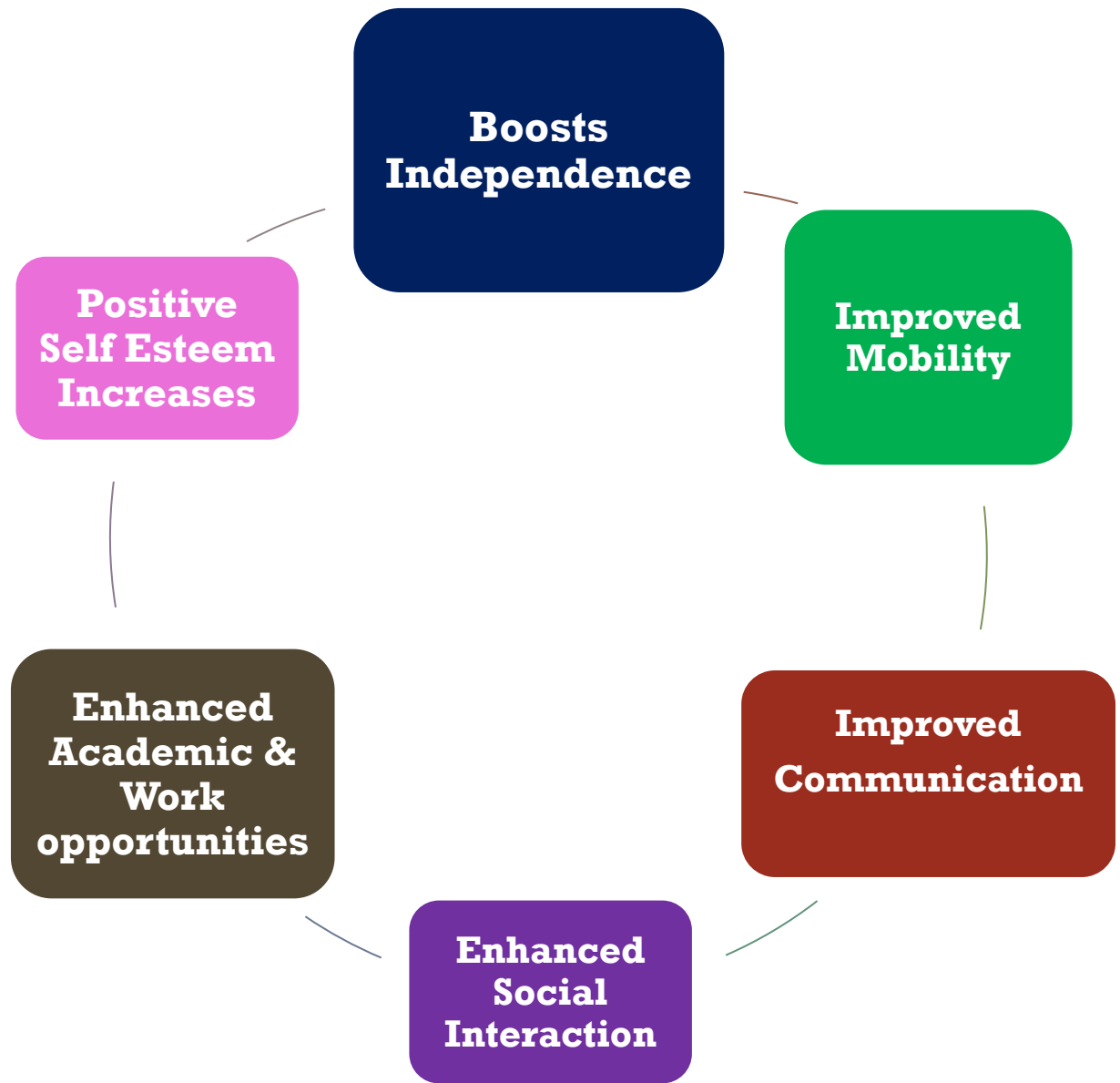
## ISO definition

An *assistive product* is any product (including devices, equipment, instruments and software), specially produced or generally available, used by or for persons with disability for participation; to protect, support, train, measure or substitute for body functions/structures and activities; or to prevent impairments, activity limitations or participation restrictions.

*Source:* Assistive products for persons with disability — Classification and terminology (ISO 9999). Geneva: International Organization for Standardization; 2016 (<https://www.iso.org/standard/60547.html>, accessed 20 April 2022).



# BENEFITS OF USING AT



# WHO NEEDS AT?

We all need..... But most importantly Assistive technology is most needed by:

1. children and adults with disabilities
2. people with long term health conditions such as diabetes, stroke and dementia.
3. Chronic Health Conditions
4. older people








# KEY FACTS

- Assistive products can range from physical products such as wheelchairs, glasses, prosthetic limbs, white canes, and hearing aids to digital solutions such as speech recognition or time management software and captioning.
- Most people who use assistive technology use more than one product, making integrated services important.
- Globally, more than **2.5 billion people need one or more assistive products.**
- With an ageing global population and a rise in noncommunicable diseases, an estimated 3.5 billion people will need assistive technology by 2050.
- In many countries, most people who need assistive technology do not have access to it.
- India, a ratified member state, needs to align with various initiatives undertaken by the WHO and the UN.

Source: WHO



# EXAMPLES OF ASSISTIVE TECHNOLOGY

Category	Product examples
<b>Mobility</b> 	<ul style="list-style-type: none"> <li>□ Walking stick, crutch, walking frame, manual and powered wheelchair,</li> <li>□ tricycle Artificial leg or hand, leg or hand splint, clubfoot brace,</li> <li>□ Corner chair, supportive seat, standing frame,</li> <li>□ Adapted cutlery and cooking utensils, dressing stick, shower seat, toilet seat, toilet frame, feeding robot.</li> </ul>
<b>Vision</b> 	<ul style="list-style-type: none"> <li>□ Eyeglasses, magnifier, magnifying software for computer,</li> <li>□ White cane, GPS-based navigation device,</li> <li>□ Braille systems for reading and writing, screen reader for computer, talking book player, audio recorder and player,</li> <li>□ Braille chess, balls that emit sound.</li> </ul>
<b>Hearing</b> 	<ul style="list-style-type: none"> <li>□ Headphone, hearing aid,</li> <li>□ Amplified telephone, hearing loop</li> </ul>
 <b>Communication</b>	<ul style="list-style-type: none"> <li>□ Communication cards with texts,</li> <li>□ communication board with letters, symbols or pictures,</li> <li>□ Electronic communication device with recorded or synthetic speech.</li> </ul>
<b>Cognition</b> 	<ul style="list-style-type: none"> <li>□ Task lists, picture schedule and calendar, picture based instructions,</li> <li>□ Timer, manual or automatic reminder, smartphone with adapted task lists, schedules, calendars and audio recorder,</li> <li>□ Adapted toys and games.</li> </ul>



# THE 5P PEOPLE-CENTRED ASSISTIVE TECHNOLOGY MODE

This figure illustrates how people in need of assistive technology are at the centre of the assistive technology system. Even though every assistive product has to be person-centered, the whole system should be ‘people-centred’.



Source: Policy brief: Access to assistive technology. Geneva: World Health Organization; 2021 (<https://www.who.int/publications/item/978-92-4-000504-4>, accessed 20 April 2022) (101).



### Accessibility

- Are services, facilities and information accessible?
- Is access equitable, regardless of factors such as gender, age, reason for need, socioeconomic groups, location?

### Adaptability

- Are products and services adaptable to the needs of individuals?
- Are services responsive to people's changing needs and goals over time?

### Acceptability

- Are efficiency, reliability, simplicity, safety and aesthetics considered when designing and providing products and related services?
- Are users able to exercise choice and control over decisions regarding their products and services?
- Are products and services appropriate, considering factors such as age, gender and culture?

### Affordability

- Are products and services affordable for all users and their families?
- Are travel costs considered?
- Have financial barriers been identified and addressed for vulnerable groups?

### Availability

- Are products and services available in sufficient quantities to serve the number of people in need?
- Is there an adequate range of products available?
- Are products and services provided close to where people live?

### Quality

- Do products meet standards including strength, durability, performance, safety and comfort?
- Do services meet guidelines, including staff training requirements?
- Are users involved in assessing quality of products and services?

# PRINCIPLES OF AT ACCESS

These principles are integral to all assistive technology systems.

System-level strategies to reduce barriers and achieve universal access to assistive technology (where everyone, everywhere receives the assistive technology they need without delay, and financial or other hardships) must be rooted in users' experiences



## Low/No-tech

- pencil grip
- adapted books
- slant board
- highlighters, tape
- magnifiers
- color coding
- read to out loud
- picture schedule
- strategies for memory
- colored transparencies
- Proof readers
- note taker

## Mid-Tech

- word prediction
- text to speech
- speech to text
- spell checkers
- talking calculators
- digital recorders
- organizers
- e-books
- adapted keyboard
- adapted mouse
- adapted toys
- CCTV

## High-Tech

- computer/laptops
- tablets/phablets
- smartphones,
- smartpens
- OCR scanner/software
- magnification software
- speech output devices
- switch, joystick access
- scanning access
- voice recognition
- environmental control devices







Robotic Vacuums

Activator rehab poles



Toilet Aid



Reminder alarm clock



TV Ears



Chair Lift

# Assistive Technology for the Elderly



Essential Medical hand bed rail



Buttoning Aid Hook



Medical Alert Device



Chair Lifts



Elderly fall Prevention



Voice Command Devices



Video Doorbell



There are many barriers to accessing assistive technology, including:

- **Lack of awareness** often drives low uptake, compounded by an absence of information on the types and availability of assistive products.
- **High costs** due to over-priced assistive products and associated service delivery cost.
- **Limited physical and geographical access** puts assistive technology out of reach for many potential users.
- **Inadequate product range, quantity, quality and suitability** can make assistive products unavailable, unsafe, ineffective and even abandoned.
- **Procurement and delivery challenges** delay and reduce access.
- **Capacity gaps exist in the assistive technology workforce** with shortage of workforce with adequate knowledge on assistive technology and lack of trained personnel.
- **Low policy profile and lack of legislation** lead to the low prioritization of assistive technology, and legislation that fails to cover people with all types of functional difficulty.
- **Lack of funding and investment** for the strengthening of national assistive technology systems exists in many countries, alongside disparities in funding levels by programmes.
- **Fragmentation of the assistive technology sector**, including between professions, user groups, funding and provision mechanisms.
- **Sociodemographic barriers** hinder equitable universal access to assistive technology.

# CHALLENGES

## Future Road map

Artificial Intelligence

Robotic Technology

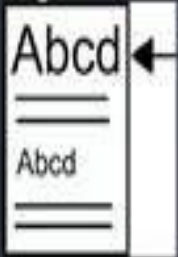
Research and  
Development

Investments



# SOME EXAMPLES

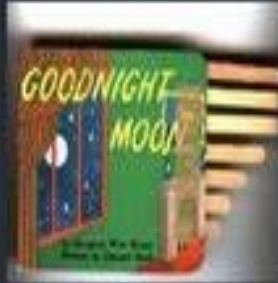
Large Print Text



Number Lines



Page Turners



Color Paper



Letter Tiles



Paper Tabs/Post-it



Clamps



100's Chart



Stamps



# SCHEDULES AND REMINDERS

## Editable Schedule Cards



Reading



8:15 - 10:15



Music



10:15 - 10:45



Math



10:45 - 11:15



Recess



11:15 - 11:45



Science



11:45 - 12:15



Social Studies



12:15 - 12:45



## Our MORNING Routine

1.



Morning Greeting

2.



Backpacks and Lunches Away

3.



Get School Supplies

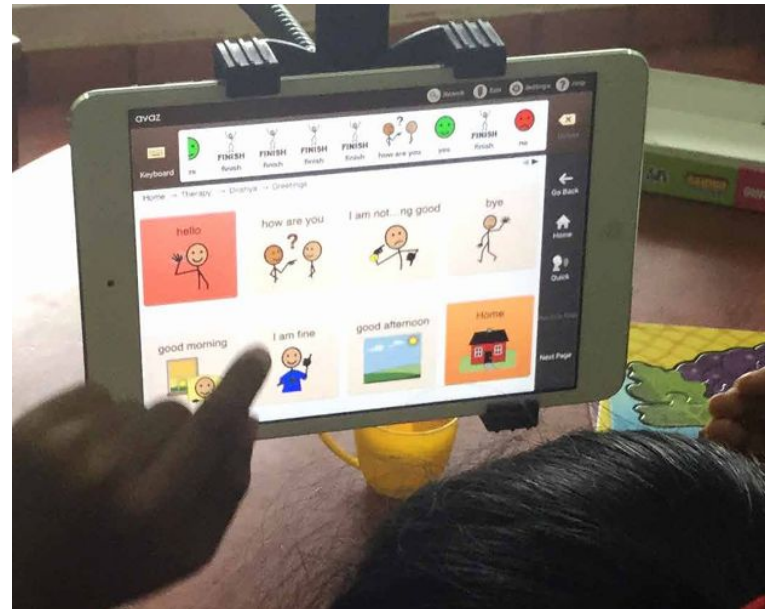
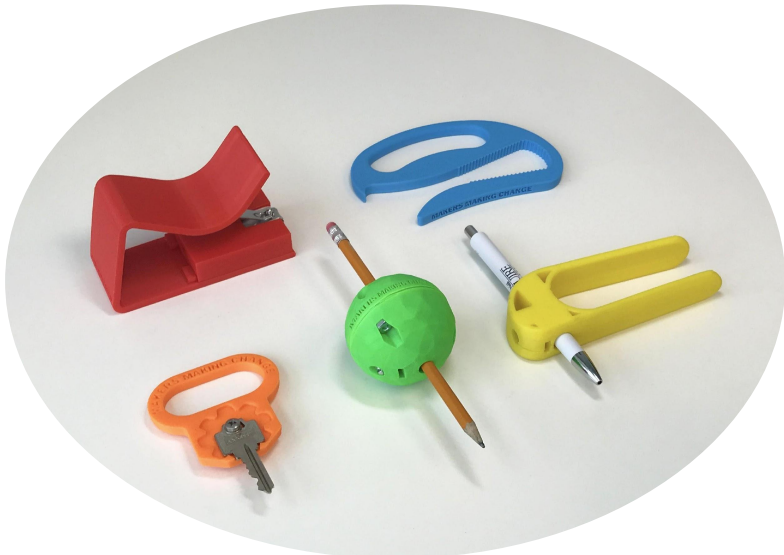
4.



Morning Work Choices



# COMMUNICATION DEVICES



# NATIONAL LIST OF ESSENTIAL ASSISTIVE PRODUCTS (NLEAP) - 2023

## PRIORITIZED TOP 21 ASSISTIVE PRODUCTS



1 HEARING AIDS



2 VISUAL AIDS



3 WHEELCHAIRS



4 WALKER/ROLLATORS



5 CANES FOR VISUALLY IMPAIRED



6 CANES FOR LOCOMOTION



7 CRUTCHES



8 ORTHOSIS



9 PROSTHESIS



10 THERAPEUTIC FOOTWEAR



11 BRAILLE





TACTILE AND AUDIO  
SIGNAGES



PORTABLE RAMPS



TRICYCLES



PHONE



COCHLEAR IMPLANT



DEAFBLIND COMMUNICATOR



RAIL BAR AND BEDSIDE GUARDS



MODIFIED COMMODE



FALL DETECTOR



INCONTINENCE PRODUCTS



# SOME MORE EXAMPLES

- SWAR - Augmented Mobile Application to Enhance Functional Communication for Children with Autism
- Jellow AAC Speech communicator -
- e-Saadhya (Saral Anukulaney Adhyayan), an adaptable and accessible e-learning software framework
- D learners - Platform for LD, Slow learners
- Edqueries – for Intellectual disability and Slow learners
- NIEPID CAI packages – for ID, Autism
- Cute Brains – Dyslexia and Dysgraphia
- Esignmeta- learners with deafness, HI



# WHERE TO GET THEM?

- Artificial Limbs Manufacturing Corporation of India (ALIMCO), a Central Public Sector Undertaking under the Ministry of Social Justice and Empowerment, Government of India. It is in Kanpur
- Many Private agencies
- ADIP scheme by DEPWD & National Institutes

**Sarv Shiksha Abhiyan**

**ADIP**  
**SSA SCHEME**  
**Support for Divyang Children**

Department of Empowerment of Persons with Disabilities

Responsibility of issuing Joint certification lies with

- School Headmaster/Principal
- Local SSA Authority
- RCI Registered Rehab Professional with active CRR No. from ALIMCO

Children with less than 40% disability can receive aids and assistive devices based on joint certification

Mandatory enrollment of beneficiaries on the UDID Portal at assessment

Motorized Tricycles available for students aged 16+ in classes IX to XII with 40%+ disability certificate and UDID Card

disemp\_govt | @adip\_sarv | depwd\_govt | @ADIPWD | Divyang Empowerment | @DEPaDikshaSarvShikshaCampaign | DEPwD

# REFERENCES

- [Global Report on Assistive Technology](#)
- [Assistive technology: The current perspective in India – PMC](#)
- [ICMR Assistive Technology Product List WEB.pdf](#)
- [Assistive technology](#)
- [20 Different Types of Assistive Technology – TechSnivel](#)
- [Homepage | Department of Empowerment of Persons with Disabilities \(DEPwD\)  
-Home | भारत](#)
- [Dlearners](#)





**We value  
your opinion  
and  
feedback**



Email:  
manogna@ncert.nic.in  
shilpamanogna@gmail.com