

Assistive Technology, Seating and Mobility Introduction to AT

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Ilanot School

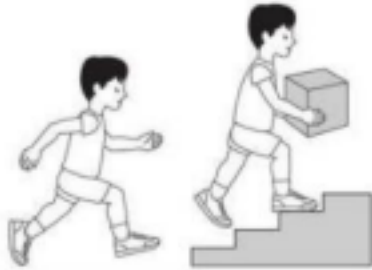
Jerusalem

March 2021

Course outline

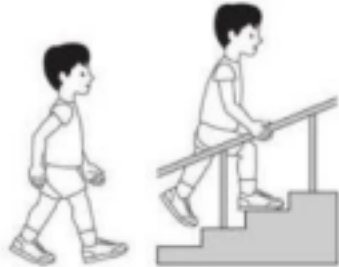
1. Wed 10.03 : Intro to AT
2. Wed 17.03 : Ergonomics of sitting and seating
3. Mon 22.03: Mobility (manual and powered wheelchairs)
4. Non-synchronic Wed 31.03: Manual wheelchair skills
5. Non-synchronic 05.04: adapting the learning environment (pairs)
6. Wed 07.04: AT for children with developmental delays and ASD (Aviva Kellar)
7. Tues 13.04 13:30-16:40 (Ramadan): Computer, tablet and smartphone accessibility
8. Tues 20.04 13:30-16:16:40 (Ramadan): Presentation of group projects and discussions

Population of the course



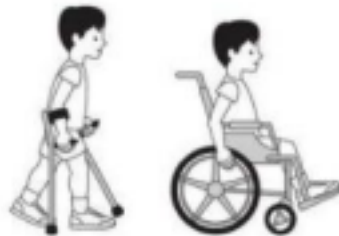
GMFCS Level I

Children walk indoors and outdoors and climb stairs without limitation. Children perform gross motor skills including running and jumping, but speed, balance and co-ordination are impaired.



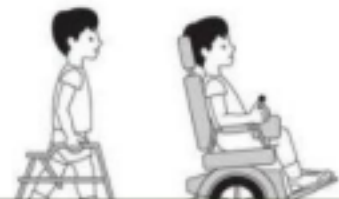
GMFCS Level II

Children walk indoors and outdoors and climb stairs holding onto a railing but experience limitations walking on uneven surfaces and inclines and walking in crowds or confined spaces.



GMFCS Level III

Children walk indoors or outdoors on a level surface with an assistive mobility device. Children may climb stairs holding onto a railing. Children may propel a wheelchair manually or are transported when traveling for long distances or outdoors on uneven terrain.



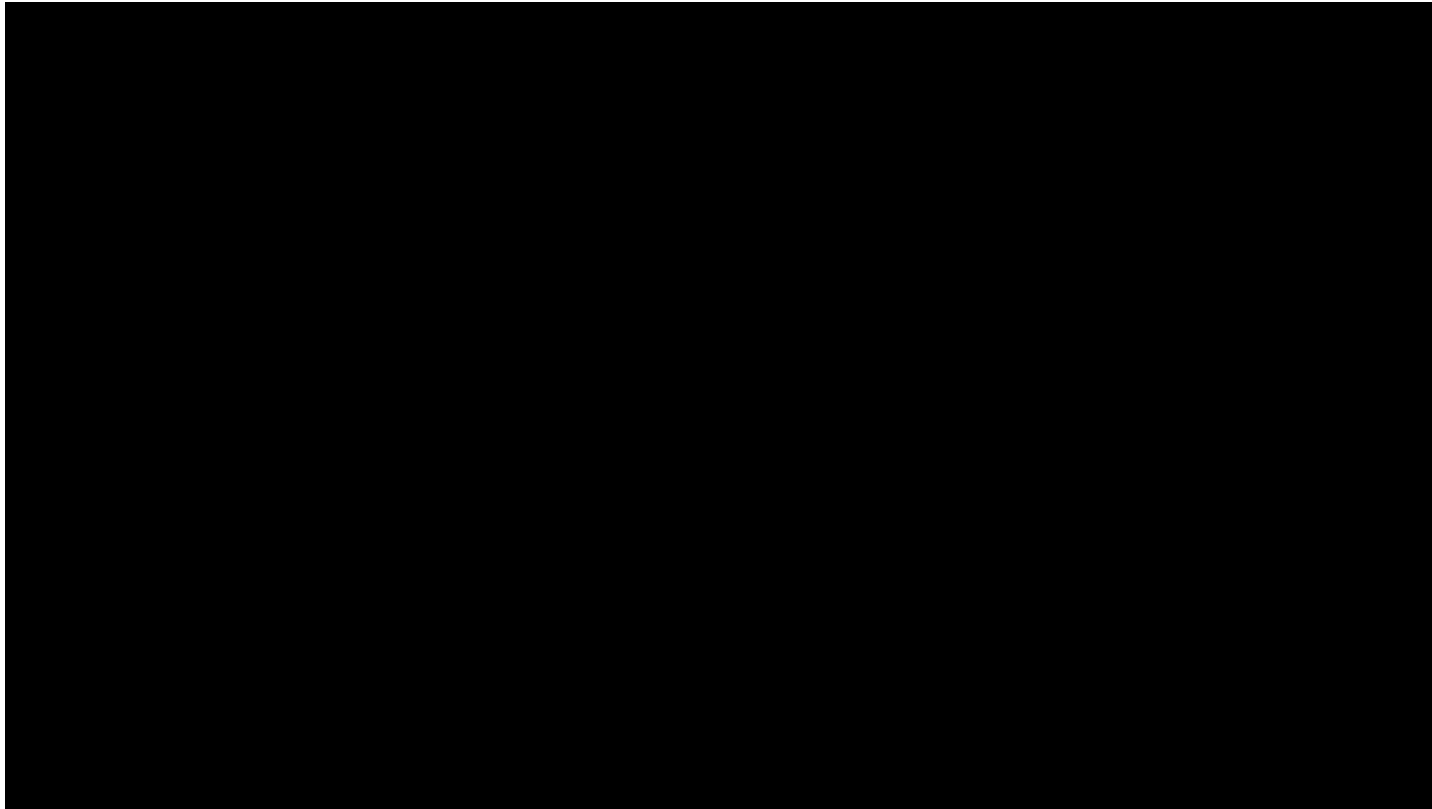
GMFCS Level IV

Children may continue to walk for short distances on a walker or rely more on wheeled mobility at home and school and in the community.

GMFCS I + II+ III

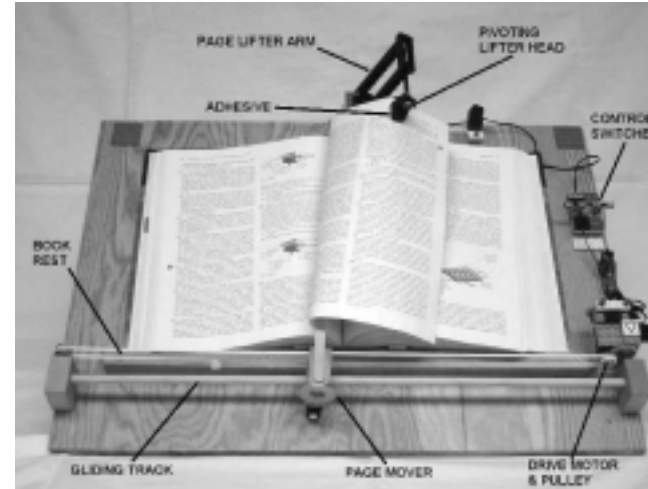
What is AT?

- <https://www.youtube.com/watch?v=DB9pKkZoJDc>



Assistive Technology (AT)

- Dynamic field
- Some static over decades
 - Hard to find “golden oldies”
- Some rapidly changing
 - Keep up with advancements
 - Update to latest versions
 - Continued training



Definition of AT

- Any piece of equipment... whether acquired commercially off-the shelf, modified or customized, used to increase, maintain or improve the functional capabilities of individuals with disabilities” (TRAIDA, 1988, 1994)

- Guiding principle:

No tech – Low tech – High tech

Not in this course

- Rehabilitation technology
 - VR
 - AR
 - Intervention technology (eg MULE....)



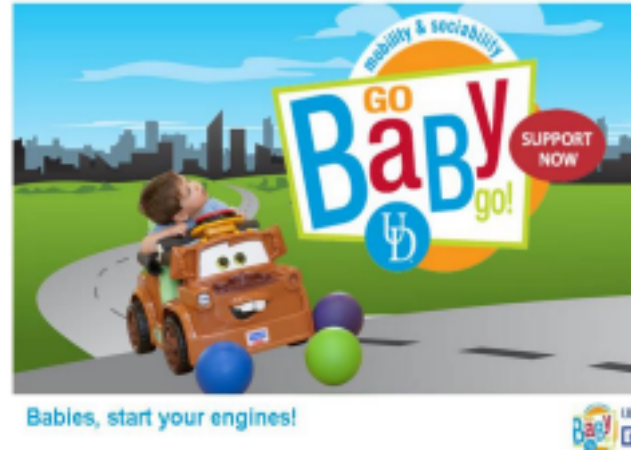
<http://www.biometricsltd.com/upper-limb-exerciser.htm> <http://www.smartwebuser.org/virtual-reality-will-soon-help-stroke-patients-to-recover>

AT not covered by MoH

- Low tech ADL aids
- EADL
- Scooters or electric ride-ons



- Some transfer aids
 - ceiling hoists, standing hoists, transfer boards
- Rehabilitation technology



Covered by MOH

- Manual wheelchairs
- Powered wheelchairs
- Seating systems
- Pressure cushions and mattresses
- Hoists



- Toileting (shower) chairs
- Augmentative and Alternative Communication
- Computers (MoE and MoH)
- Stair climbers
- Profiling beds
- Children's stander
- Adapted vehicles (National Insurance)



<http://www.assisport.co.il/articles/>

Positive impact

- Children:
 - play
 - Discovery
 - allows development
- Control of the environment



- Independence
- Self-efficacy, increased initiation, responsibility
- Increase status from others' perspective
- Increased social interaction

Problem

- 30% (USA) of AT is discarded within the 1st year

Problem with AT

30% non-use

- Professionals not aware of options
- Mismatched assessments (including on daily life
- Mismatched expectations (rehab vs functional)
- Lack of training to use AT (staff, client, therapist)
- Lack of understanding of the impact



- Lack of communication between school-parent-healthcare
- Maintenance

(Copley & Ziviani, 2004; Lilja, Bergh, Johansson & Nygard, 2003; Scherer et al.,2005)

Negative aspects of AT



- Acceptance of the loss
- Visibility
- Stigma
- Bureaucracy
- New routines
- Financial decision
- Choosing from many options
- Frustration with breakdowns/ repairs

(Mortenson, Fuhrer, Jutai, Lenker & DeRuyter, 2012; Roy et al, 2008)

Take home message

- Helping the families
 - Emotional, listening
 - Helping choose AT
 - Helping with bureaucracy
- Training use of AT
- Maintenance of AT



Copied from:

<http://edenautism.org/assistive-technology/>

Adherence to AT

- Conceptual review: factors effecting adherence

1. Psychological

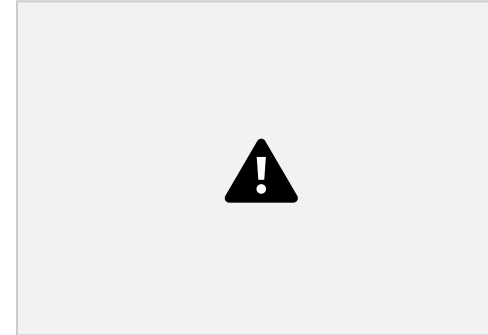
- Feeling the effect on their life
- Motivational
- Confidence in the use

2. Contextual

- Rapport to therapist
- Shared decision making relationship
- Family feel it a burden

3. Functional

- Doesn't do the job



Tuazon, Jahan & Jutai, 2018

Adherence to AT

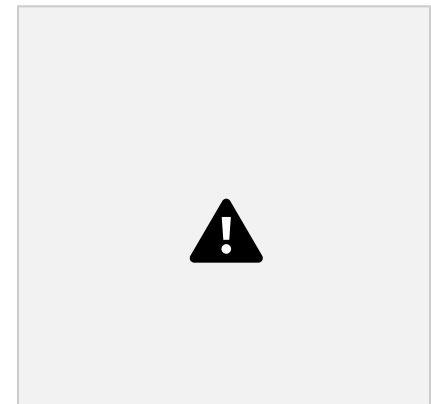
Conclusion of a meta-analysis:

- Move from “expert” frame to client’s choice
- AT according to environments (physical and social)
- Encourage client to solve problems and make adaptations
- Accessible information for the client
- Holistic assessments

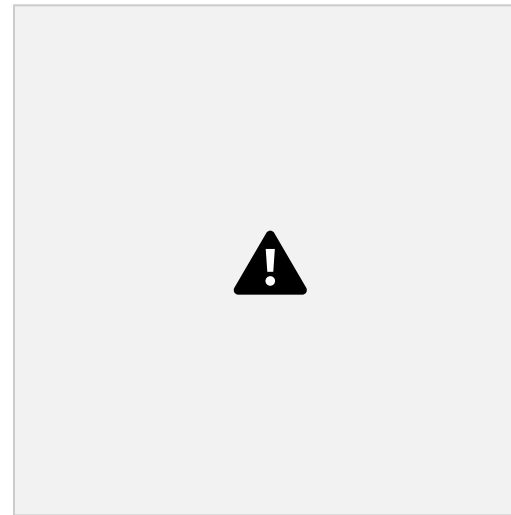
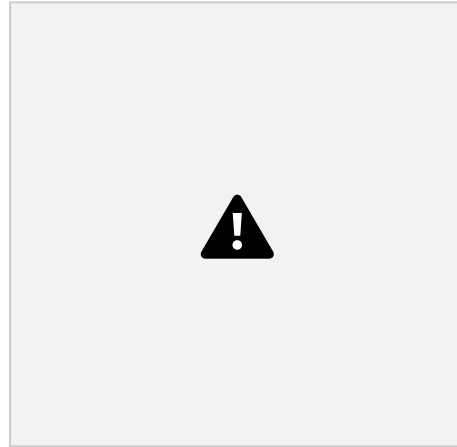
Howard et al., 2020

choices

Home adaptation



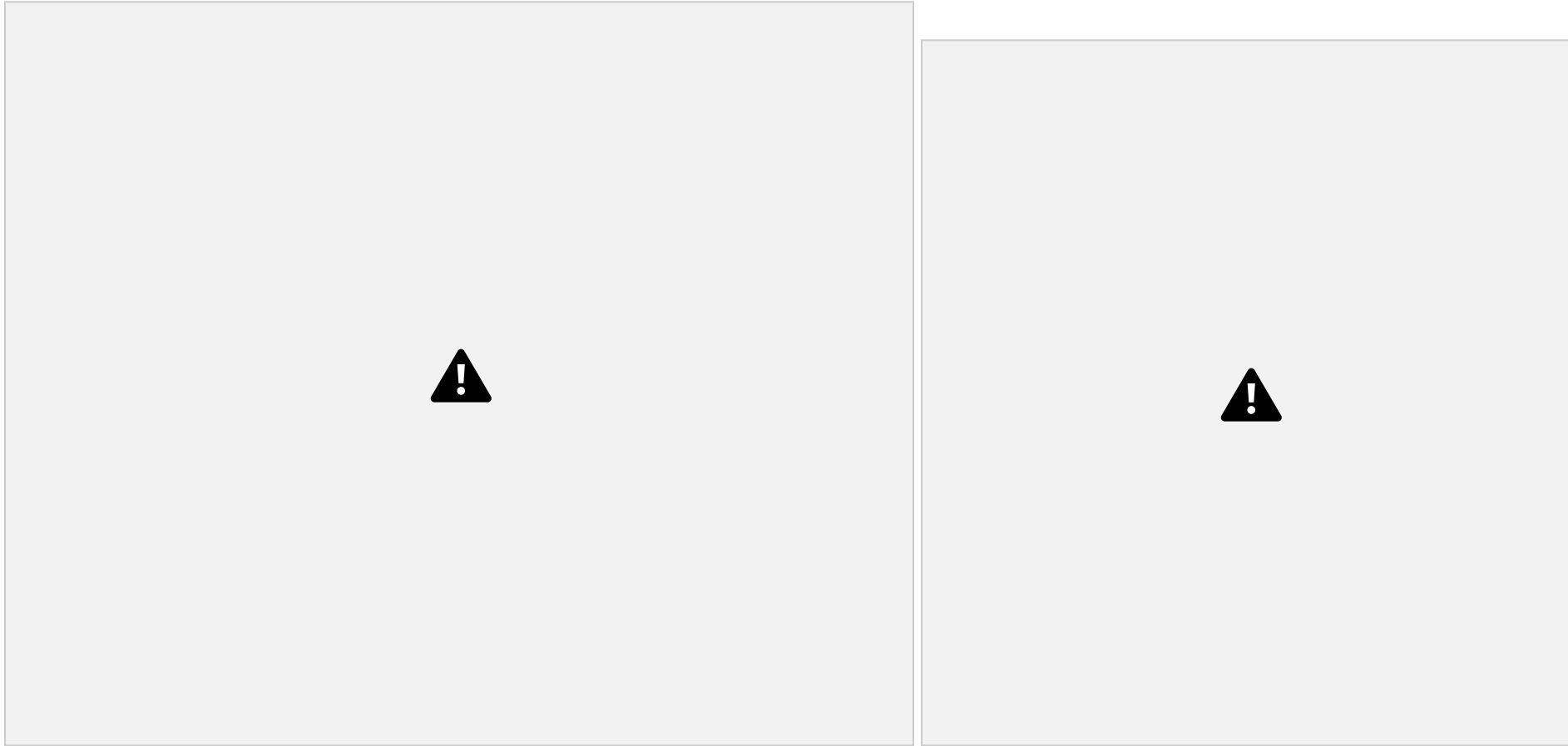
Compliance rose from 33%- 80% when given three choices



(Stark et al, 2009; Seamon 2013)

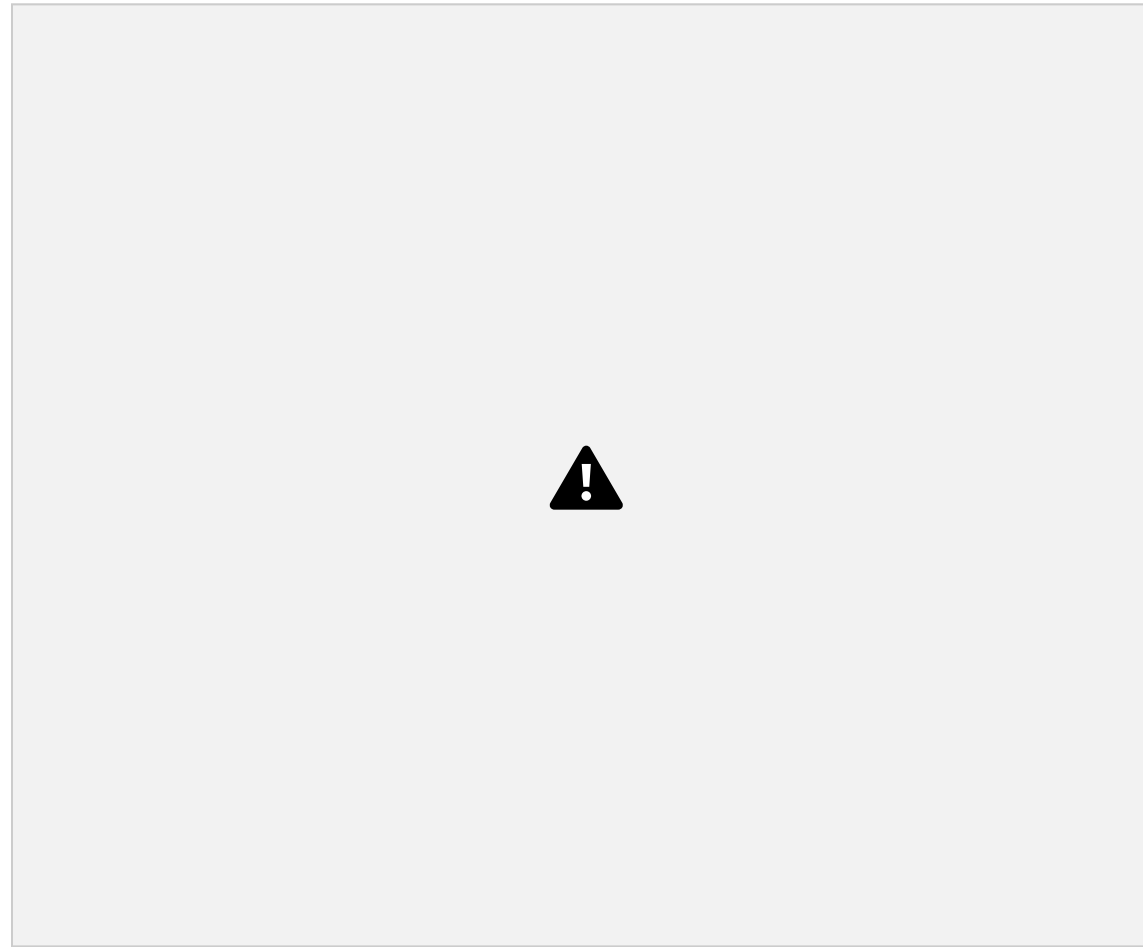


HAAT Human Activity Assistive Technology



PET

Person- Environment-Tool



Person

function

Tool Environment

Part of the Social model of disability:

Person= all people

Tool:= all equipment

Jarl & Lungqvist, 2020

Stages of acceptance

1. Pre-contemplation
2. Contemplation
3. Preparation
4. Action

5. Maintenance

(Prochaska & Velicer, 1997)

**Understanding the
client** Chase & Hissong (2011)

AT in older adults



A qualitative systematic review and meta-synthesis
Larsen, Mortensen, Kristensen & Houngaard, 2019

AT in older adults

Additional conclusions:

- Follow-up is a must
 - Use of AT effects self-image: relate to it in treatment •



Influence of social environments: take this into account

What take home message can
we learn for schools?

Larsen, Mortensen, Kristensen & Houngaard, 2019

AT

activity



human

context

Assessment

AT

Person

Occupational performance (ADL, IADL, learning, leisure), body functions and structures, expectations, acceptance.....

Context

Physical, social, cultural, institutional

Activity

Which activities will use



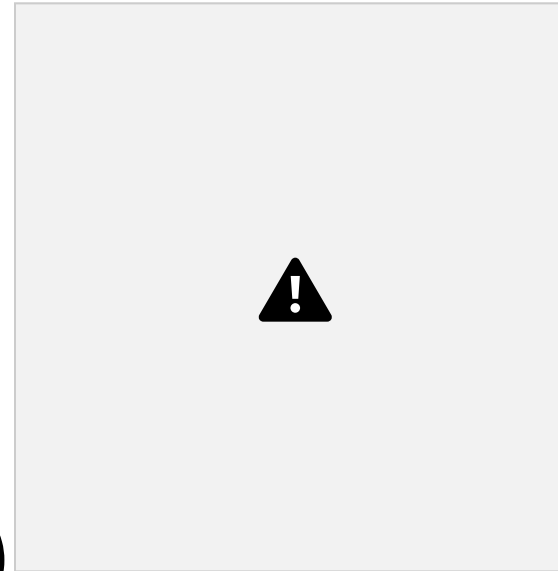
Matching AT to the student

- Different expectations
- Diverse responses to AT
- Past experiences
- Self-image
- Ethical considerations

MPT

Matching Person & Technology

(Marcia J. Scherer)



- Evaluating the person – Assistive Technology Device
– environments where it will be used

MATCH – Matching Assistive Technology and Child

ATD contexts

<https://sites.google.com/view/matchingpersontechnology/products>

MATCH – Matching Assistive Technology and Child

- The ***Worksheet for Matching Assistive Technology and Child*** to obtain [parent perspectives](#) of a child's particular limitations, goals and interventions as well as strengths which can be built upon in planning interventions.

- • The ***Technology Utilization Worksheet for Matching Assistive Technology and CHild*** to review technologies the child is currently using, has used in the past, and needs.
- • The ***Survey of Technology Use (SOTU)*** to help identify technologies and technology functions/features a child is likely to feel comfortable or successful in using so a new technology is planned around existing comfort or success.
- • The ***MATCH: Matching Assistive Technology and CHild*** to select the most appropriate assistive technology for a child's use while pinpointing areas for training and further assessment.

https://drive.google.com/file/d/1w8NiPGS1Yw_js9BcMezxQ9VfpuT1JGh3/view

worksheet







QUEST



https://www.midss.org/sites/default/files/questeng.scoring_sheetpdf_0.pdf

Other assessments

- CATOM (Caregiver AT Outcome Measure, Mortensen et al 2015)
 - Influence of AT according to caretaker (!5 min)
 - English + French
- PIADS (psychosocial impact of assistive devices scale)

Jutai & Day, 2002)

- Self report on influence of AT
- ATOMS (AT Outcome Measurement System-Edyburn & Smith, 2004)

School assessments

• **Wisconsin Assistive Technology Initiative**

<http://www.wati.org/?pageLoad=content/supports/free/index.php>

Resources to
help

Choose AT for
the classroom

School



assessments

- **Georgia Project for Assistive Technology**

<http://www.gpat.org/Georgia-Project-for-Assistive-Technology/Pages/default.aspx>

- **Functional Evaluation for Assistive Technology**

- **Article comparing assessments:**

<http://www.tamcec.org/pdf/TIA%20Oct%202008.pdf>

School assessments

- **SETT: Student Environment Task Tool**

http://joyzabala.com/uploads/Zabala_SETT_Scaffold_Consideration.pdf



Process of acquiring AT





Break out rooms

Think about an AT that you might recommend for a student. Try to fill out one of the assessments

1. MATCH worksheet

2. MATCH technology utilization

3. QUEST

4. SETT

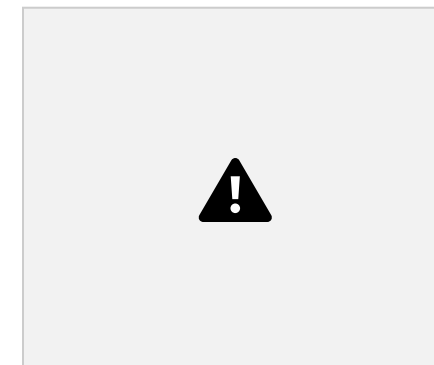
5. WATI

Was it useful to understand the whole picture? Was it user-friendly?

AT hearing

- Many people with a hearing impairment are not aware of it
- Study: 162 people in hospital, 58 had hearing impairments and were not aware

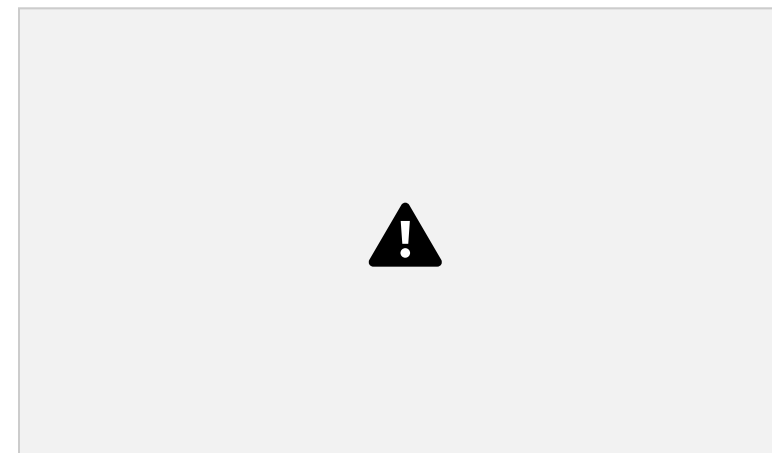
<https://www.cbsnews.com/news/hearing-aids-you-aint-heard-nothing-yet/>



AT for hearing

The problem:

- Less social activity
- Less engagement
- Cognitive effects
- Developmental effects.....

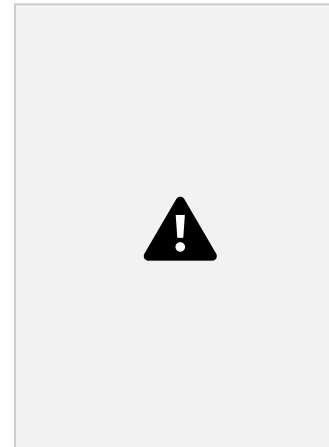


Hearing aids can raise volume instead of making speech

clearer Awareness and Referral!

AT for hearing

- Programmable
- GPS sensitive (bus verses house)
- Directional microphones
- Blue tooth for phones, TV...



- Options for placement (behind ear, in ear, in channel...)



AT for vision Low-tech

- **Bigger**
 - Larger print

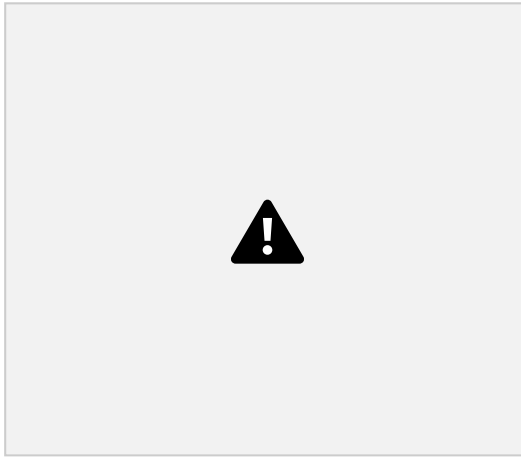
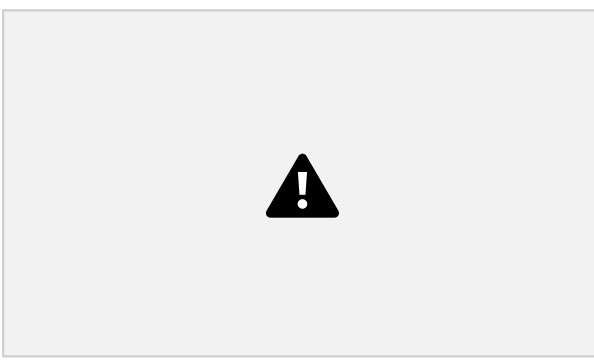
- Magnifying glass • **Brighter**
- lighting
- **Bolder**
- Contrast
- Dark pens
- **Borrowed**
- Braille
- Seeing-eye dog
- cane
- F + J on keyboard

- Hello (font 28)

- **Hello**

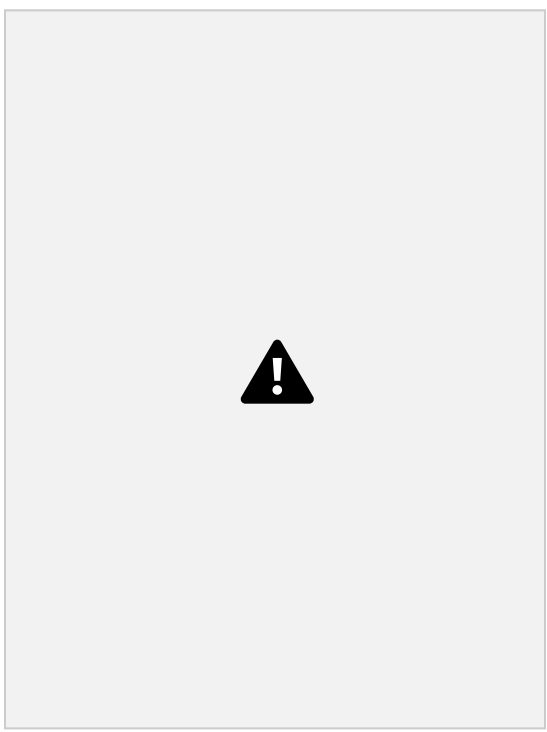
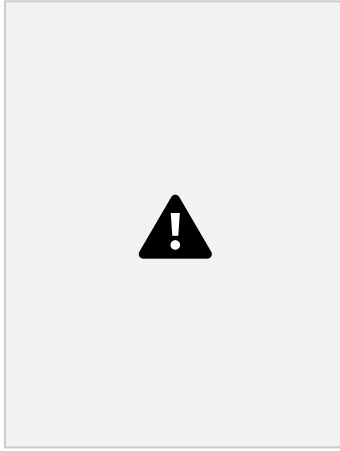
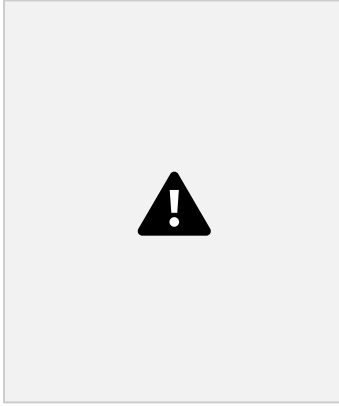
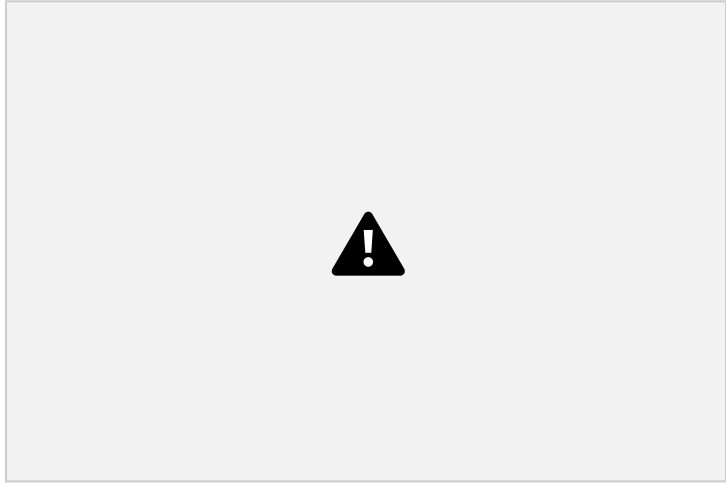
- Hello (font 14)

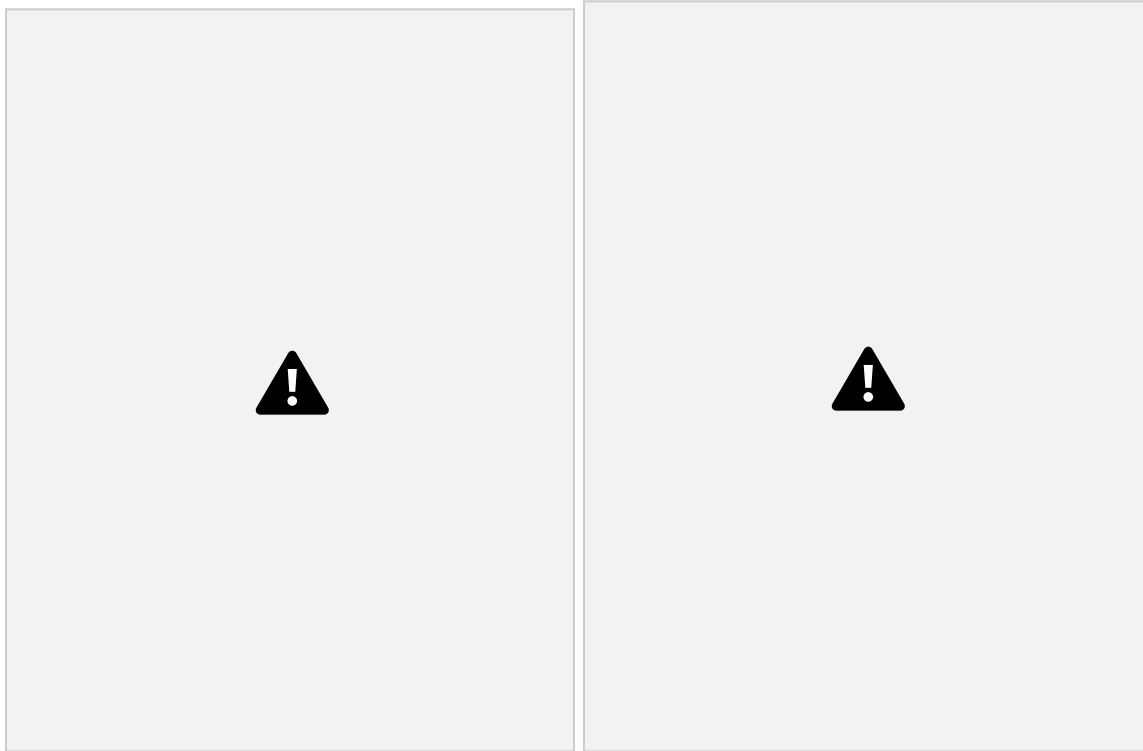
• Hello (60)



Hello

Hello Hello Hello





AT for vision high-tech

- **Bigger and Brighter**
 - CCTV
 - Enlarging screen and curser
 - Hand help CCTV



- Tablets
- **Bolder**
 - Programs to add contrast
 - Special keyboards
- **Borrowed**
 - Text-speech and Speech-text
 - Optical character recognition
 - Refreshable braille
 - Scriptalk (reads packages).....

Cognitive AT

Goals:

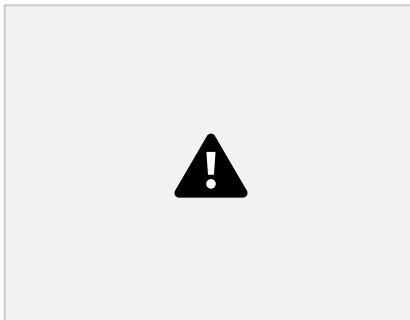
- Increase independence
- Raise QoL
- Remedial or rehab

Types:

- Warning
- Reminders (alarms, calendars...)
- Time managements (neuropage)
- Micro-prompting
- Memory (incl. use of photos)
- Concentration (bio feedback...)



<https://hcbsprovider.com/assistive-devices-and-tools-for-people-with-disabilities/>

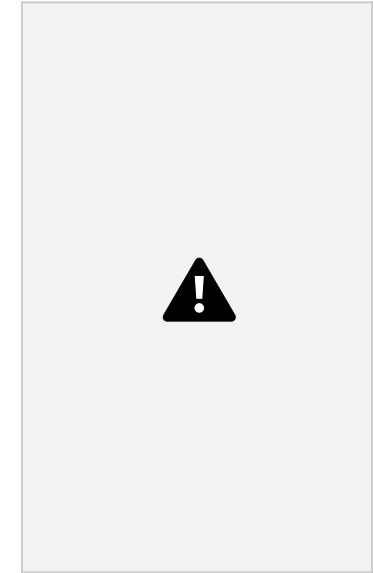
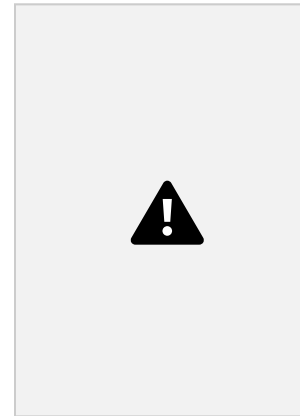
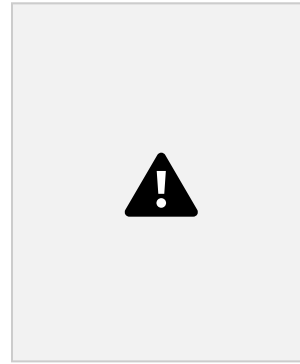
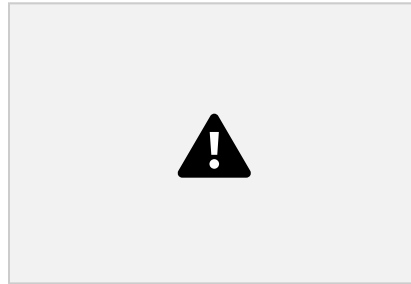


AT for physical disability

- Hoists



- Toilet chairs
- Stair climbers
- Profiling beds
- Standers
- Mobility aids
-



Break out rooms

- Choose a student with a visual, auditory, cognitive or physical limitation.
- Find at least AT solution that would help
 - Share a photograph of the AT
 - Describe how it works

- What are the advantages?
- What are the disadvantages?

Thank you

