



# ICT role in physical disabilities

PORTUGAL AND SPAIN

# Program for Day 4 – 03/07/2017 - Monday

09.30 Presentation (Portugal and Spain)

10.40 Coffee break

11.00 Workshop of Portugal and Spain

12.30 Lunch at Sakarya University Campus

14.30 Workshop of Portugal and Spain (Continuation)

16.00 Coffee break

16.20 Workshop (Student Presentation and Conclusions)

17.30 Cultural Expression (Portuguese students' presentation about Albania) and (Spanish students' presentation about Turkey),

# TELESEICT main propose

Main purpose of KA2-TELESEICT it's to raise the awareness in teacher training of the use of ICT – digital competences, when creating good learning environments for pupils in need of special support.

The project will highlight the use of ICT with people with different disabilities in special educational contexts and settings, and thus allow access to ICT for almost everyone.

# IP Turkey

## Day 4 - main propose

**Know some assistive technology and identify the possible role of this technology in special education, in particularly for students with physical disabilities**

**Assistive technology** is an [umbrella term](#) that includes all kind of devices and software that promote inclusion in educational environments of students [with disabilities](#)

# Role of ICT in education



- ▶ <https://www.youtube.com/watch?v=NfN5SSiRoPs&t=4s>

# Adaptation and modification



<https://www.youtube.com/watch?v=O0xdaCEqrU0>

# Physical disabilities

- ▶ Children with physical disabilities find gross movements difficult and may also have difficulties with finer movements, or a combination of both.
  - ▶ Many students with physical disabilities cannot write or type, others can only do so at a slow pace and the end result may still be illegible. Others may have visual perceptual difficulties, impaired speech or may even be nonverbal.
- ▶ Access to the curriculum can be difficult for children with physical disabilities.
  - ▶ Unfortunately, many aspects of the curriculum were inaccessible to these children until the advent of Information and Communication technologies (ICT) in recent years.

So ICT has the potential to enhance participation in educational activities for students with physical disabilities

# Types of Physical/Motor disabilities

- ▶ Traumatic Injuries
  - ▶ Spinal cord injury
  - ▶ Loss or damage of limb(s)
- ▶ Diseases and Congenital Conditions
  - ▶ Cerebral palsy
  - ▶ Muscular dystrophy
  - ▶ Multiple sclerosis
  - ▶ Spina bifida
  - ▶ ALS (amyotrophic lateral sclerosis)
  - ▶ Arthritis
  - ▶ Parkinson's disease
  - ▶ Essential tremor



# Key Concepts

## Key Concepts: Motor Impairments

### Challenges

Users may not be able to use the mouse.

Users may not be able to control the mouse or the keyboard well.

Users may be using voice-activated software.

Users may become fatigued when using “sip-and-puff” or similar adaptive technologies.

### Solutions

Make sure that all functions are available from the keyboard (try tabbing from link to link).

Make sure that your pages are error-tolerant (e.g. ask "are you sure you want to delete this file?"), do not create small links or moving links.

Voice-activated software can replicate mouse movement, but not as efficiently as it can replicate keyboard functionality, so make sure that all functions are available from the keyboard.

Provide a method for skipping over long lists of links or other lengthy content.

# how ICT is being used by students with physical disabilities

- ▶ Type of ICT used differed among impairment groups, and ICT seemed to be especially beneficial for
  - ▶ writing,
  - ▶ spelling and
  - ▶ communication.

# Main ICT categories used by students with physical disabilities

- 1) text-generating hard- and software
  - ▶ computer, all kind of devices that can have a role to help people,
  - ▶ word processing, word prediction software
- 2) speech-generating hard- and software
  - ▶ communication aids, text-to-speech device, speech synthesizer
- 3) access solutions
  - ▶ computer input interface,
  - ▶ screen-keyboard
- 4) special software
  - ▶ software for education in maths,
  - ▶ spelling, multimedia software.

# Devices they help students with physical disabilities are:

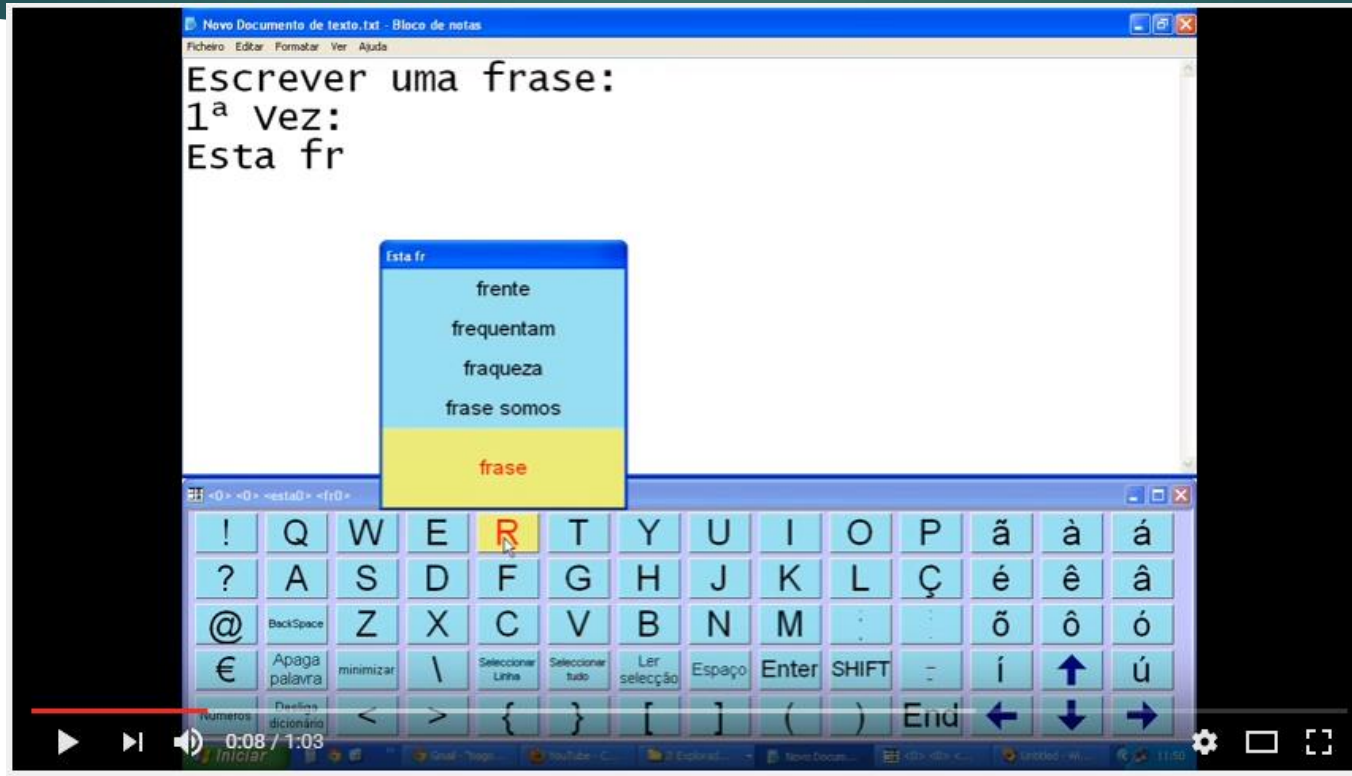
- ▶ [Eye tracking](#)
- ▶ [Mouth stick](#)
- ▶ Mouse Foot
- ▶ [Head wand](#)/pointer
- ▶ [Single-switch access](#)
- ▶ [Sip and puff switch](#)
- ▶ [Adaptive keyboard](#)/Overlay  
KeyBoard
- ▶ [Oversized trackball mouse](#)
- ▶ Joysticks
- ▶ Touchpads
- ▶ switches and scanning systems
- ▶ [Voice recognition software](#)
- ▶ [Other assistive technologies](#)

# Eye tracking - MagicKey



▶ <https://www.youtube.com/watch?v=Qmzo8Fp1kko>

# Overlay Keyboard– MagicKeyBoard and text prediction



- ▶ <https://www.youtube.com/watch?v=FKOpABawZ9U>
- ▶ <https://www.youtube.com/watch?v=Xr9UnP-Viwg>

# Switch system



- ▶ <https://www.youtube.com/watch?v=Q5omml5pEv4>

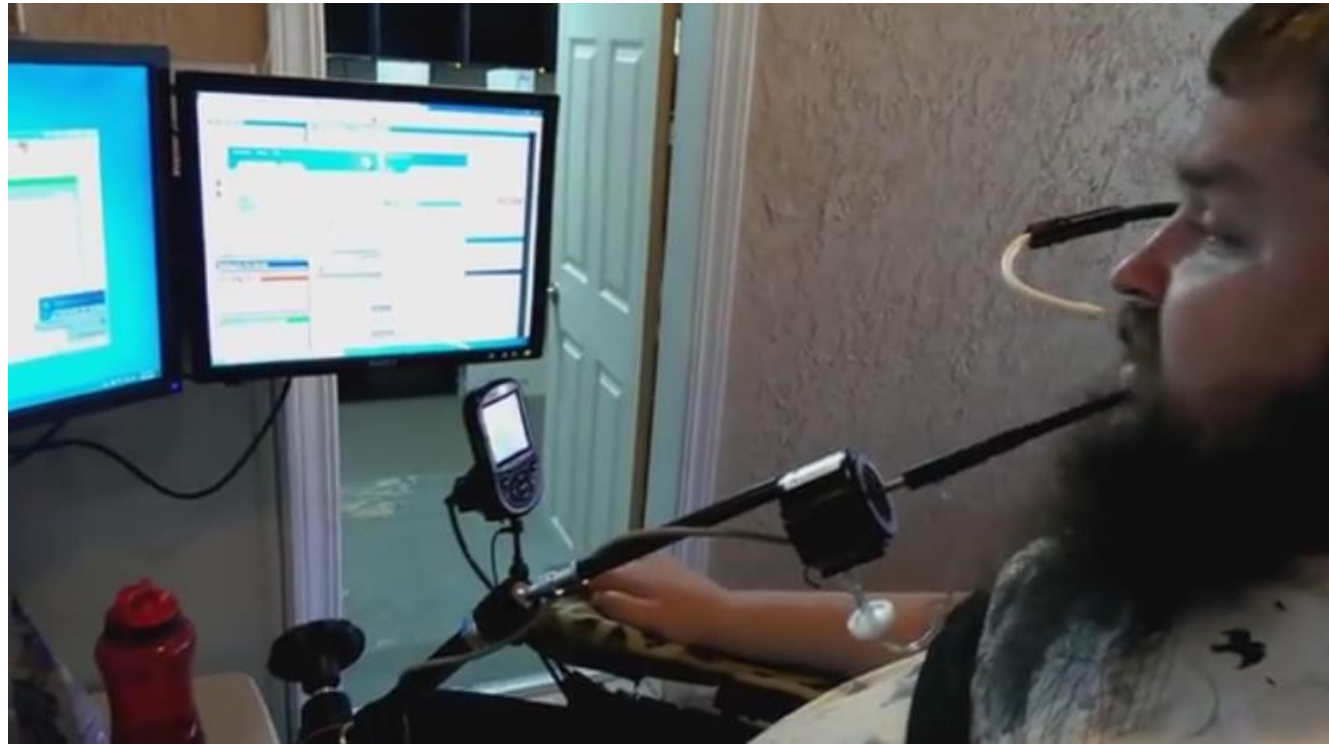
# Head Pointer



- ▶ <https://www.youtube.com/watch?v=q070e0qxLEg>
- ▶ <https://www.youtube.com/watch?v=pB3yUguXLy0>



# Sip and puff switch



▶ [https://www.youtube.com/watch?v=fFi5\\_ctNF10](https://www.youtube.com/watch?v=fFi5_ctNF10)

# Overlay Keyboard

**Overlay keyboard** is a specialized keyboard with no pre-set keys.

Each key can be programmed with a wide range of different functions.



# Example of adaptation activities

## Traditional Example

- ▶ <https://www.education.com/worksheets/article/color-by-subtraction/>
- ▶ <https://www.education.com/worksheets/article/multiplication-crossword/>

## Using ICT and assistive technology

- ▶ <https://www.education.com/game/subtraction-pizza-party/>
- ▶ <https://www.education.com/game/matching-pictures-equations/>

# Short list of Authoring tools

- ▶ <https://www.classmarker.com>
- ▶ <https://www.flexiquiz.com/>
- ▶ <https://testmoz.com>
- ▶ <https://www.easytestmaker.com/>

# Task

Create some exercises for students with 6 to 10 years:

- ▶ Design exercises for students, with and without disabilities, for mathematics and mother language.

Final output (PDF 1 and PDF 2)

- ▶ PDF 1 (Without Disability)
  - ▶ Practice exercises of Maths and Mother Language
- ▶ PDF 2 (With Disability) Same exercises with adaption
  - ▶ Identify the motor disability and the level , eg low, middle or high disability
  - ▶ Identify activities that use assistive technology
  - ▶ Identify the needs of your classroom to develop the activities
- ▶ Show how students with disabilities can make the adapted activities, show the online exercises, list of hardware that can be use for enable students to use the online exercises other software that can help students to learn the subject.