

# DISABILITY MANAGEMENT

buone pratiche  
e prospettive  
future in Italia

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Aula Rogers  
Scuola di Architettura  
Via Ampère 2

# Disability Management: attenzione clinica e formazione professionale

**Licia Sbattella**

*Professore associato,  
Delegato del Rettore per le situazioni di disabilità  
Politecnico di Milano*  
[licia.sbattella@polimi.it](mailto:licia.sbattella@polimi.it)

# The POLIMI Inclusive Model



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- **The MultiChancePoliTeam (MCPT)** is the group of specialists that provides personalized services to students with Disabilities and Specific Learning Difficulties (SpLD).
- The Politecnico model aims to encourage **professionalism, individual autonomy, innovation, creativity, and social inclusion** – with no special treatment in the assessment of the skills that are actually acquired – and **supports the intermediation phase with labor market**

# Becoming protagonist of innovative ICT research



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- **In 2016: 38000 students at Polimi:**
  - 28000 engineering
  - 7000 architecture
  - 3000 design
- **Students with Disability and SpLDs:**
- **From 2003 to June 2016 (from 96 to 476)**
  - Motoric: from 44 to 39
  - Visual: from 4 to 14
  - Hearing: from 15 to 11
  - Psychiatric: from 1 to 20
  - Organic: from 30 to 94
  - SpLD: from 2 to 298
- **Gender and Faculty**
  - 57% Engineering, 43% Architecture or Design
  - 74% Male, 26% Female

# Employment data for students with disability



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- **From 2003: 0% unemployment rate for Engineers**
- **From 2003: Engineering, Architecture and Design (to June 2016): 107**
  - **Direct Employment:** 58%
  - **Stage, then Employment:** 28%
  - **Stage:** 14%
- **By disability:**
  - **Hearing:** 14%
  - **Motoric:** 36%
  - **Organic:** 37%
  - **Visual:** 10%
  - **Psychic:** 3%

# Employment data for students with disability



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- **From 2003: Engineering, Architecture and Design - Company Sectors:**
- **31%** ICT
- **19%** Public Sectors
- **12%** Architectural, Real Estate, Building
- **12%** Electronic, Electric, Energetic
- **4%** Aeronautical
- **6%** Finance, Insurance, Banking
- **1%** Environmental
- **5%** Mechanics
- **9%** Other (chemistry, pharmacy, transportation)
- **2%** Fashion

# A successful model for stage and employment



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## **Italian 68/99 act - "Protected categories"**

The person with disability as a productive resource and not just a legal obligation

## **Graduating and graduate students (up to 18 months) with a certified percentage of invalidity above 46%**

1. First contact
2. Assumption
3. Internship & Recruiting
4. Follow-up

# A successful model for stage and employment



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## Students

### 1. First contact

**Open day** Special conference Admission test  
Professional skills - Possible pathways – Bureaucracy

### 2. Assumption

68/99 act  
Desires, skills, opportunities  
Personal CV and self-presentation  
Check of documentation

### 3. Internship

Technological devices  
Compatibility  
Monitoring  
Career Service

### 4. Recruiting

Search and selection of the company  
Wishes and needs  
Working environment  
Personal communication and technological /IT equipment  
(assistive technology)

### 5. Follow-up

Timing  
Critical situations  
Change of job

## Employers

### 1. First contact

Career day – Workshops - Special events  
Website

### 2. Assumption

Free subscription to portal  
Needs, job offers, requests  
Partnerships and relationships  
Encoded CVs

### 3. Internship

Availability, compatibility and accessibility of the environment  
Verification of duties and tasks  
Check of the requirements set out in the 68/99 act  
Career Service

### 4. Recruiting

Accessibility  
Duty compatibility < > disability  
Working environment compatibility < > disability  
Working station co-financed adaptations

### 5. Follow-up

Timing  
Critical situations  
HR, manager, co-workers

# Specific Learning Difficulties



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<b>Diagnosis</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Average</b>	<b>Poor</b>	<b>Very poor</b>	<b>Undef.</b>
<b>Intellect. capacity</b>	26	30	13	12	1	0	14
<b>Long-term memory</b>	0	42	0	8	2	2	42
<b>Short-term memory</b>	0	14	4	26	0	11	41

**Specific Learning Difficulties**  
Diagnosis /Architecture & Design  
(2014/2015)



# Specific Learning Difficulties



**POLITECNICO**  
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<b>Diagnosis</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Average</b>	<b>Poor</b>	<b>Very poor</b>	<b>Undefined</b>
Dyslexia	0	6	10	57	10	13	0
Dysgraphia	0	47	2	29	3	12	3
Dysortho-graphy	0	20	14	34	9	16	3
Dyscalculia	0	30	21	29	4	7	5

**Specific Learning Difficulties**  
Diagnosis /Architecture & Design  
(2014/2015)

# Specific Learning Difficulties



**POLITECNICO**  
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<b>Diagnosis</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Average</b>	<b>Poor</b>	<b>Very poor</b>	<b>Undef.</b>
Intellect. capacity	24	37	15	10	1	0	29
Long-term memory	2	36	2	5	0	0	71
Short-term memory	1	17	1	14	0	8	75

## Specific Learning Difficulties

Diagnosis /Engineering  
(2014/2015)

# Specific Learning Difficulties



**POLITECNICO**  
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<b>Diagnosis</b>	<b>Excellent</b>	<b>Very good</b>	<b>Good</b>	<b>Average</b>	<b>Poor</b>	<b>Very poor</b>	<b>Undef.</b>
Dyslexia	7	7	7	72	11	11	1
Dysgraphia	8	35	8	38	6	17	4
Dysorthography	11	27	11	45	10	12	0
Dyscalculia	15	57	15	20	3	5	1

## Specific Learning Difficulties

Diagnosis /Engineering  
(2014/2015)

# The ICF\* Model



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- Students are invited to describe themselves using the **ICF\* Model** (a customized version of the WHO ICF Model)
- **ICF\*** provides a simpler yet expressive model for the description of university students and for the personalization of software applications
- **ICF\*** has been used also to profile companies to support employment

## **We:**

- Discarded some Constructs (*s, body structures*)
- Condensed some Domains
- Substituted some Domains with more specific ones (i.e. upper and lower limbs stability)
- Added a new Construct named '**t ITF Skills**'
  - t1 Act on the System Interface
  - t2 Understand the System Interface

# Personal and Personalized Support



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- **MultiChancePoliTeam: the team of experts** (1 psychologist, 1 psychotherapist, 2 computer scientists, 1 architect, 2 coordinators)
- **Pedagogical support**
  - Zero discount and 'reasonable accommodation'
  - Supporting curricula
  - Monitoring specialized tutoring
- **Psychological support**
  - Group activities
  - Personal Counseling
  - Psychotherapy

# Personal and Personalized Support



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- Monitoring the quality of the service - 2015 data
  - Sensorial Disability 9,7%
  - Motoric Disability 11,1%
  - Relational Disability 1,4%
  - Lectures Attending Difficuties 15,3%
  - Specific Learning Difficulties 62,5%
  
  - Degree 30,6%
  - Master Degree 69,4%
  
  - Engineering 62,5%
  - Architecture 22,2%
  - Design 12,5%
  - Engineering / Architecture 2,8%

# Applications supporting academic life



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## THE CATS Project supported by MIUR

**PoliSpell** developed an advanced spell checker, specific for users with SpLD. The spell checker exploits the context in order to capture “out of context” words (e.g., “pile” vs. “pine”), and provides a predictor, suggesting the next most probable word to insert, given the last words written by the user and the previous user’s behavior.

# Applications supporting academic life



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**SPARTA2** is a tool supporting the authoring of highly accessible Italian texts. It provides two kind of information: numeric estimations of the complexity of texts, and warnings/advice about phrase structures that appear to be the problematic parts of the text. It suggests where the critical parts are, and how to modify them

**The Readability Index** is composed of three sub-indexes: the *Gulpease Index*, the *Chunk Index*, and the *Chunk Type Index*

**The Understandability Index** measures the complexity related to the lexicon. And to the structure of the sentences.



# Applications supporting academic life



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## PoliNotes

- Slides shown by the teacher are subdivided in *objects*
- And sent *in real time* to the student's Tablet-PC
- The contents can be *rearranged* on the electronic sheet
- The student can also add *notes and drawings* using a stylus

**PoliLips** - In a single integrated solution we mix the three information modalities we can collect from the teacher:

- visual (lips-reading),
- aural (amplified signals),
- and textual (generated by an ASR application)

# Applications supporting academic life



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- **PoliBook:** an electronic text book that emulates a paper book and permits students to add notes and new pages
- **BiText:** a Multilingual eBooks reader. Exploits eBook natural dynamicity. Show translation, on demand
- Other supports for **Accessible Distance Learning**

# Applications supporting academic life



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## **KEaKI** (Knowledge Extraction and Knowledge Inference)

- Document Analysis: to summarize and to infer knowledge
- Domain description based on ontology (a knowledge base)
- Mental map generation for SpLD
- Facilitation of text comprehension

# Applications supporting academic life



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**KaSPAR** (Karaoke Speech-Prosody Analyzer and Recognizer) is a prosodic multimodal software, currently under construction, supporting students with Auditory Disability and SpLD on learning English as a foreign language.

The project uses knowledge coming from different fields of study, first of all, creating a link between learning English prosodic problems in SpLD and the extraction of acoustic features, already known in the Music Information Retrieval field and MPEG-7 encoding.

# INFORMATION ACCESSIBILITY FOR LEARNING - GUIDELINES



- **The ICT4IAL Project:** from development to implementation of Guideline (available at [www.ict4ial.eu](http://www.ict4ial.eu))
- **The ICT4IAL network:** European Agency, European Schoolnet, DAISY Consortium, G3ict, International Association of Universities, and UNESCO
- To encourage and support different educational contexts and related organizations **to adopt more inclusive strategies**

# INFORMATION ACCESSIBILITY FOR LEARNING - GUIDELINES



- **How to produce:** accessible texts, pictures, audio, video, on-line electronic documents, on-line resources, slides and presentations, teaching and learning materials on specific formats (as pdf, ePub), ...
- **The importance of** local, national and international policies that involve different stakeholders
- **Open and un-sufficient points:** Open Access, accessible materials and contents production, copyrights and digital version of books, different policies for Italian Libraries, training of specialists on Accessibility

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**Licia Sbattella, PhD** – Bioengineer, Clinical Psychologist and Psychotherapist is Associate Professor of Natural Language Processing and Accessibility and Rector’s Delegate for Disability at Politecnico di Milano. Since 2007 she is member of the Program Committee of the UN G3ict (Global Initiative for Inclusive ICTs). Since 1983 she is founder and scientific director of Esagramma - a clinic and research center in Milano - and since then she conducts the Esagramma Symphonic Orchestra: the first symphonic group in Europe that gives concerts and involves professional musicians and persons with intellectual disabilities and autism.

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**Per un contatto diretto con:**

**Comitato scientifico**

[Veronica.Mattana@gmail.com](mailto:Veronica.Mattana@gmail.com)

[Consuelo\\_Battistelli@it.ibn.com](mailto:Consuelo_Battistelli@it.ibn.com)

**Comitato organizzativo**

[ConvegnoDM2016@pianetapersona.org](mailto:ConvegnoDM2016@pianetapersona.org)

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