



Co-funded by the
Erasmus+ Programme
of the European Union



Partnering Outside the Box: Digital and Artificial Intelligence Integrated Tools to Support Higher Education Students with Dyslexia

7th April 2022





Co-funded by the
Erasmus+ Programme
of the European Union



ToT: Training of Trainers

Department of Philosophy, Social Sciences, and Education

University of Perugia

Elisa Delvecchio, Claudia Mazzeschi, Annalisa Morganti, Moira Sannipoli



A.D. 1308
unipg

UNIVERSITÀ DEGLI STUDI
DI PERUGIA

Agenda of the first session

- **Warm up**
- **Universal Design for Learning - UDL**
- **UDL key principles**
- **Activity: discover UDL**



Warm up: **Make Toast**

Draw a picture or describe how to make toast. That is darkened crispy bread.



Try to illustrate the important actions to someone who has never made toast before.



How are the illustrations similar?

In what ways do they differ?

Which are clearer? Why?

Which contain unexpected elements?

**What have we learned from this
activity?**

What have we learned from this activity?

- Everyone has their own way of thinking
- Everyone has their own way of solving problems
- Everyone needs to adapt your own thinking to that of others when working together

The slide features a white background with dark blue geometric shapes in the corners. A large blue triangle is in the top-left corner, and a smaller blue triangle is in the bottom-right corner. Both triangles have a lighter blue gradient layer beneath them, creating a layered effect.

Universal Design for Learning - UDL

Universal Design for Learning

- ❖ Research supporting Universal Design for Learning (UDL) has grown exponentially.
- ❖ UDL is a framework that works to **remove barriers in the education system** for individuals **with or without** a disability.
- ❖ Universal Design is an approach that was initially developed to adapt the structure environment (building, curbs, etc.) to improve access for individuals with physical disabilities.
- ❖ The concept of Universal Design has now been applied to learning and has been found to be beneficial for all individuals.

From “Universal Design” to “Universal Design for Learning” (UDL)

The American research group **CAST** (Center for Applied Special Technology) has extended the “Universal Design” movement in pedagogy and education to make existing curricula more accessible and cater for individual student variability through flexible objectives and inclusive assessment methods, materials and processes.

(CAST, 2018)

Pedagogical reference model that aims to guide educational practice by identifying and removing obstacles in curricular teaching materials to address the variety of students' needs.

Universal Design for Learning

- ❖ UDL is a system for education that focuses on **learner variability** and the **unique needs** of each student.
- ❖ Similar to how one teaching style does not work for everyone, neither does one learning style.
- ❖ It is essential to have a system that accounts for individual variance.
- ❖ UDL has been shown to improve the quality of education as a whole.

UDL pillars

1. UDL takes individual variability as the norm;
2. UDL helps satisfy variability by proposing principles that involve multiplicity and flexibility;

We are all different in learning

Universal Design for Learning

Affective networks:

THE **WHY** OF LEARNING



How learners get engaged and stay motivated. How they are challenged, excited, or interested. These are affective dimensions.

Recognition networks:

THE **WHAT** OF LEARNING



How we gather facts and categorize what we see, hear, and read. Identifying letters, words, or an author's style are recognition tasks.

Strategic networks:

THE **HOW** OF LEARNING

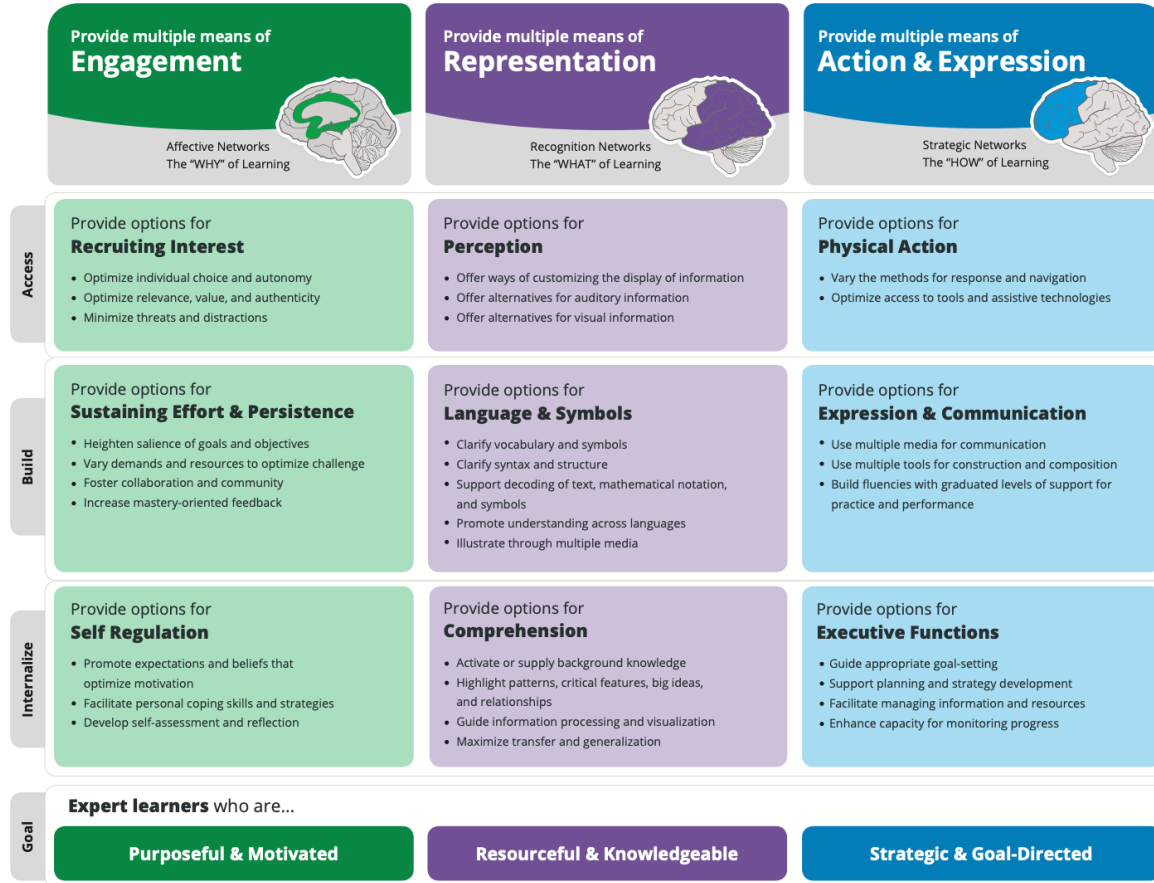


Planning and performing tasks. How we organize and express our ideas. Writing an essay or solving a math problem are strategic tasks.

***"Accessibility" in
educational contexts***

- Learning implies a specific change in the concrete area in which it occurs.
- Unnecessary barriers must be removed without eliminating necessary changes.
- Access to all areas of learning.
- Active individual and protagonist of his own development
- Ability to experience is the basis for building knowledge.
- Educator as a builder of opportunities to learn.
- In educational spaces, it allows the autonomy of the student, offers both accessible corners and materials, mostly at his/her disposal, without the constant mediation of the adult.
- An essential characteristic of accessibility is the absence of significant barriers, the safety of buildings, furniture and materials.

UDL key principles



Design of UDL

Multiple Means of Engagement

- ❖ Connects to the learners affective brain network, which is the “why” of learning.
- ❖ Engagement refers to how the students interact with the material, instructors and peers in the classroom environment.
- ❖ Increase collaboration, interest, effort and self-regulation.
- ❖ Allows the learner to be purposeful and motivated.

PRINCIPLE I - UDL

Provide multiple means of Engagement

- ❑ The “**WHY**” of learning.
- ❑ Close integration that exists between **cognitive processes** and **motivational** and **emotional** systems and how these interact on learning.
- ❑ **Affect** represents a crucial element to learning, and learners differ markedly in the ways in which they can be engaged or motivated to learn.
- ❑ There are a variety of sources that can influence individual variation in affect (e.g. neurology, culture, personal relevance, subjectivity, and background knowledge...).
- **There is not one means of engagement that will be optimal for all learners in all contexts**
- ***Providing multiple options for engagement is essential***

Provide multiple means of
Engagement



Affective Networks
The “WHY” of Learning

Provide options for
Recruiting Interest

- Optimize individual choice and autonomy
- Optimize relevance, value, and authenticity
- Minimize threats and distractions

Provide options for
Sustaining Effort & Persistence

- Heighten salience of goals and objectives
- Vary demands and resources to optimize challenge
- Foster collaboration and community
- Increase mastery-oriented feedback

Provide options for
Self Regulation

- Promote expectations and beliefs that optimize motivation
- Facilitate personal coping skills and strategies
- Develop self-assessment and reflection

PRINCIPLE I - UDL

Provide multiple means of Engagement



GUIDELINE 7. PROVIDE OPTIONS FOR RECRUITING INTEREST

- Information that is not paid attention to, that does not engage student's cognition, is effectively inaccessible.
- Teachers strive to capture student's attention and engagement but they differ significantly in what attracts their attention and engages their interest. Even the same student will differ over time and circumstances; their 'interests' change as they develop and acquire new knowledge and skills.
- It is important to have alternative ways of recruiting students' interest that reflect the important inter- and intra-individual differences between students.

PRINCIPLE I - UDL


Provide multiple means of Engagement



CHECKPOINT 7.1 - Optimize individual choice and autonomy

- In an instructional educational setting, it is often appropriate to offer choices about how that goal can be achieved, the context for achieving the goal, the tools or supports available, and so on.
- Offering learners choices can develop self-determination, pride in achievement, and increase the degree to which they feel connected to their learning.
- Individuals differ in the amount and type of choices they prefer to have. It is therefore not enough to simply provide a choice. The right type of choice and level of independence must be optimised to ensure engagement.

Provide multiple means of Engagement



EXAMPLE of IMPLEMENTATION

CHECKPOINT 7.1 - Optimize individual choice and autonomy

- Provide learners with as much discretion and autonomy as possible by providing choices in such things as:
 - The level of perceived challenge
 - The type of rewards or recognition available
 - The context or content used for practicing and assessing skills
 - The tools used for information gathering or production
 - The color, design, or graphics of layouts, etc.
 - The sequence or timing for completion of subcomponents of tasks
- Allow learners to participate in the design of classroom activities and academic tasks
- Involve learners, where and whenever possible, in setting their own personal academic and behavioral goals

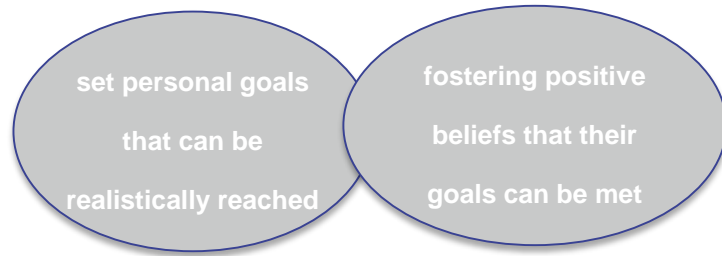
PRINCIPLE I - UDL

Provide multiple means of Engagement

CHECKPOINT 9.1 - Promote expectations and beliefs that optimize motivation

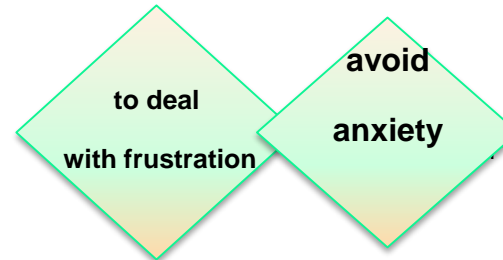


- One important aspect of self-regulation is the personal knowledge each learner has about what he or she finds motivating, be it *intrinsic* or *extrinsic*.
- Learners need to be able to:



- To accomplish this, learners need to be able to: meeting their goals.

- Multiple options need to be given to learners to help them stay motivated.



the process of

Provide multiple means of Engagement

EXAMPLE

of

IMPLEMENTATION

CHECKPOINT 9.1 - Promote expectations
and beliefs that optimize motivation

- Provide prompts, reminders, guides, rubrics, checklists that focus on:
 - Self-regulatory goals like reducing the frequency of aggressive outbursts in response to frustration
 - Increasing the length of on-task orientation in the face of distractions
 - Elevating the frequency of self-reflection and self-reinforcements
- Provide coaches, mentors, or agents that model the process of setting personally appropriate goals that take into account both strengths and weaknesses
- Support activities that encourage self-reflection and identification of personal goals

Design of UDL

Multiple Means of Representation

- ❖ Connects to the learners recognition brain network, which is the “how” of learning.
- ❖ Representation refers to how the material is given in the classroom, such as lectures, visuals, audio, videos, hands-on activities.
- ❖ Increase the likelihood that students can learn and memorize more effectively.
- ❖ Allows the learner to be resourceful and knowledgeable.

PRINCIPLE II - UDL

Provide multiple means of Representation

- ❑ The “**WHAT**” of learning
- ❑ Learners differ in the ways that they perceive and comprehend information that is presented to them.
- ❑ For example, those with learning disabilities (e.g., dyslexia) may all require different ways of approaching content. Others may simply grasp information quicker or more efficiently through visual or auditory means rather than printed text.
- ❑ Also learning, and transfer of learning, occurs when multiple representations are used, because they allow students to make connections within, as well as between, concepts.

→ There is not one means of representation that will be optimal for all learners

→ *Providing options for representation is essential*

Provide multiple means of Representation



Recognition Networks
The “WHAT” of Learning

Provide options for Perception

- Offer ways of customizing the display of information
- Offer alternatives for auditory information
- Offer alternatives for visual information

Provide options for Language & Symbols

- Clarify vocabulary and symbols
- Clarify syntax and structure
- Support decoding of text, mathematical notation, and symbols
- Promote understanding across languages
- Illustrate through multiple media

Provide options for Comprehension

- Activate or supply background knowledge
- Highlight patterns, critical features, big ideas, and relationships
- Guide information processing and visualization
- Maximize transfer and generalization

PRINCIPLE II - UDL

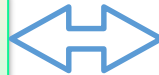
Provide multiple means of Representation



GUIDELINE 1. PROVIDE OPTIONS OF PERCEPTION

- Learners differ in the ways that they perceive and comprehend information that is presented to them.
- Learning is impossible if information is imperceptible to the learner, and difficult when information is presented in formats that require extraordinary effort or assistance.
- To reduce barriers to learning, it is important that key information is equally perceptible to all student by:

*Providing the same information through different modalities (e.g.,
through vision, hearing, or touch)*



*Providing information in a format that will allow for adjustability by
the user (e.g., text that can be enlarged, sounds that can be
amplified)*

→ Such multiple representations not only ensure that information is accessible to learners with particular sensory and perceptual disabilities, but also easier to access and comprehend for many others.

PRINCIPLE II - UDL

Provide multiple means of Representation



EXAMPLE

of

IMPLEMENTATION

CHECKPOINT 1.1 - Offer ways of customizing
the display of information

- The size of text, images, graphs, tables, or other visual content
- The contrast between background and text or image
- The color used for information or emphasis
- The volume or rate of speech or sound
- The speed or timing of video, animation, sound, simulations, etc.
- The layout of visual or other elements
- The font used for print materials

PRINCIPLE II - UDL

Provide multiple means of Representation

CHECKPOINT 1.2 - Offer alternatives for auditory information

- Sound is a particularly effective way to convey the impact of information.
- The human voice is particularly effective for conveying emotion and significance. information.
- Conveyed solely through sound is not equally accessible to all learners and is especially inaccessible for learners with hearing disabilities, for learners who need more time to process information, or for learners who have memory difficulties.
- Listening is a complex strategic skill that must be learned. To ensure that all learners have access to learning, options should be available for any information, including emphasis, presented aurally.



Provide multiple means of Representation

EXAMPLE

of

IMPLEMENTATION

CHECKPOINT 1.2 - Offer alternatives for auditory information

- Use text equivalents in the form of captions or automated speech-to-text (voice recognition) for spoken language
- Provide visual diagrams, charts, notations of music or sound
- Provide written transcripts for videos or auditory clips
- Provide American Sign Language (ASL) for spoken English
- Use visual analogues to represent emphasis and prosody (e.g., emoticons, symbols, or images)
- Provide visual or tactile (e.g., vibrations) equivalents for sound effects or alerts
- Provide visual and/or emotional description for musical interpretation

Design of UDL

Multiple Means of Action & Expression

- ❖ Connects to the learners strategic brain network, which is the “what” of learning.
- ❖ Action and Expression refers to how students demonstrate what they have learned and be assessed on their work.
- ❖ Students can complete a task in different and meaningful ways.
- ❖ Allows the learner to be strategic and goal-directed.

PRINCIPLE III - UDL

Provide multiple means of Action & Expression

- ❑ The “**HOW**” of learning.
- ❑ Learners differ in the ways that they can navigate a learning environment and express what they know.
- ❑ For example, individuals with significant movement impairments (e.g., cerebral palsy), those who struggle with strategic and organizational abilities (executive function disorders) or language barriers and so forth approach learning tasks very differently.
- ❑ Action and expression require a great deal of **strategy, practice, and organization**.
- There is not one means of action and expression that will be optimal for all learners
- *Providing options for action and expression is essential*

Provide multiple means of
Action & Expression

Strategic Networks
The “HOW” of Learning



Provide options for
Physical Action

- Vary the methods for response and navigation
- Optimize access to tools and assistive technologies

Provide options for
Expression & Communication

- Use multiple media for communication
- Use multiple tools for construction and composition
- Build fluencies with graduated levels of support for practice and performance

Provide options for
Executive Functions

- Guide appropriate goal-setting
- Support planning and strategy development
- Facilitate managing information and resources
- Enhance capacity for monitoring progress

PRINCIPLE III - UDL

Provide multiple means of Action & Expression



GUIDELINE 4. PROVIDE OPTIONS FOR PHYSICAL ACTION

- Limited navigations and interactions (e.g., turning pages, writing in designated spaces, using a joystick or keyboard) will raise barriers for some learners - those with physical disabilities, blindness, specific learning disabilities such as dysgraphia, or who require support for executive functions.
- It is important to provide materials with which all learners can interact.
- Appropriate curricular materials provide an interface with common assistive technologies through which individuals with mobility impairments can navigate and express what they know (e.g. navigate or interact with a single button, through voice-activated buttons, expanded keyboards and other products).

PRINCIPLE III - UDL

Provide multiple means of Action & Expression

CHECKPOINT 4.1 - Vary the methods for response and navigation



- Students differ in their ability to navigate their physical environment.
- Provide alternative means for response, selection and composition to reduce the emergence of possible barriers to learning when faced with the motor demands of a task.
- Learners differ in their optimal means of navigating through information and activities. To provide equal opportunities for interaction with learning experiences, an educator must ensure that there are multiple means for navigation and that control is accessible.

Provide multiple means of Action & Expression

EXAMPLE



of

IMPLEMENTATION

CHECKPOINT 4.1 - Vary the methods
for response and navigation

- Provide alternatives in the requirements for rate, timing, speed, and range of motor action required to interact with instructional materials, physical manipulatives and technologies
- Provide alternatives for physically responding or indicating selections (e.g., alternatives to marking with pen and pencil, alternatives to mouse control)
- Provide alternatives for physically interacting with materials by hand, voice, single switch, joystick, keyboard, or adapted keyboard

PRINCIPLE III - UDL

Provide multiple means of Action & Expression

CHECKPOINT 4.2 - Optimize access to tools and assistive technologies



- Providing a learner with a tool is often not enough.
- Provide support to use the tool effectively.
- Many students need help to navigate their environment (both in terms of physical space and curriculum).
- Provide opportunities for all to use tools to achieve the goal of full participation in the classroom.
- A significant number of students with disabilities and specific difficulties need to use assistive technologies regularly for navigation, interaction and composition.
- It is essential that educational technologies and curricula do not impose unintentional barriers to the use of these assistive technologies (e.g. ensuring that keyboard commands are present for each mouse action).

Provide multiple means of Action & Expression

EXAMPLE

of

IMPLEMENTATION

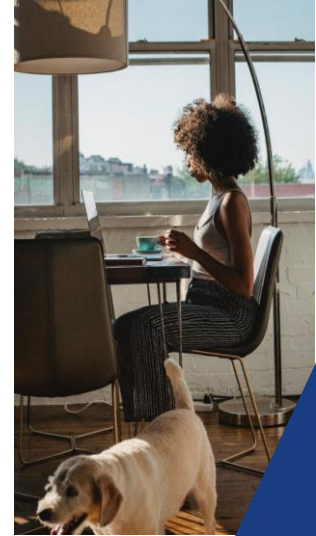
CHECKPOINT 4.2 - Optimize access
to tools and assistive technologies

- Provide alternate keyboard commands for mouse action
- Build switch and scanning options for increased independent access and keyboard alternatives
- Provide access to alternative keyboards
- Customize overlays for touch screens and keyboards
- Select software that works seamlessly with keyboard alternatives and alt keys

UDL for Higher Education

❖ Why use UDL in higher education?

- Use to deal with significant times of change in the world and be adaptable.
- Create an inclusive curriculum that allows everyone an equal opportunity to succeed.
- Transform novice learners into expert learners.
- Create competent learners who will succeed in the workforce when they graduate.



Into practice...



- **Activity: discover UDL**

Individual Activity

You wish to implement UDL in your classroom or in your work. You learn that it is best to incorporate a strategy from all three principles of UDL.

Please pick up one (or more) strategy you are going to try for each of the categories: 1. multiple means of engagement, 2. multiple means of representation, and 3. multiple means of action and expression.

<https://goalbookapp.com/toolkit/v/strategies>

Agenda of the second session

- **University students with dyslexia**
- **Italian universities model**
- **Unipg model**
- **Student's voice**
- **Activity: what about your university?**

Taking care the student with Dyslexia

ITALIAN UNIVERSITIES: Different tools for information and analysis

Guidelines

Vademecum

Regulation

Services Charter

→ **AIM:** to build a common language and practices of intervention in the same

University

Guidelines

LAW 8, 2010, n. 170

"Students with specific learning disorders are guaranteed adequate forms of verification and assessment during their school and university education and training, also with regard to state and university entrance exams and university exams" (DSA Guidelines, MIUR, 2001).

CNUDD Guidelines (www.cnudd.it)

Basic indications for the provision, while respecting the autonomy of each university, of appropriate and as homogeneous services as possible inspired by shared principles of acceptance, participation, autonomy and integration of students with specific learning disorders.

The commitment is to promote and support access to university.

Services

ACCESS TO SERVICES: The need for self-reporting

- In order to access the services provided by the University, including for the purposes of admission tests to study courses, students must present a clinical diagnosis of dyslexia.
- The self-diagnosis represents an acknowledgment of the identity of the student who, as a young adult, can take control of his her condition and decide autonomously how to move in the new course of study.

ITALIAN MODEL

SERVICE FOR STUDENTS WITH DYSLEXIA

INCOMING ORIENTATION

ACCESSIBILITY OF COMMUNICATIONS (website and documents)

COMPENSATORY AND DISPENSATORY MEASURES

TECHNOLOGICAL AND DIDACTIC AIDS

TECHNOLOGY LABORATORIES

MEDIATION WITH TEACHERS AND REFEREES

TUTORING

PSYCHOLOGICAL COUNSELING SERVICE

PEDAGOGICAL COUNSELING SERVICE

OUTGOING ORIENTATION

INCOMING ORIENTATION

The first opportunity for students to meet universities is represented by entry orientation practices through:

- Travelling exhibitions in schools or permanent ones in the universities in specific periods
- Individual and personalised meetings with the University orientation services

WEBSITE

Most universities provide information on student services through:

- Specific sections
- Sections dealing with Dyslexia
- General sections dedicated to student services

COMPENSATORY AND DISPENSATORY MEASURES

- The guidelines - Law n. 170/2010: compensatory tools and dispensatory measures can be proposed to the student, both during the teaching activity and during the performance of admissions, verification and assessment tests.
- Matriculation and enrolment at University: compilation of in-depth forms that allow the student to tell his school history, indicating compensatory tools and dispensatory measures used in the secondary school course.
- Objective: to identify the most appropriate and functional intervention right from the start of the university course.
- Given the great variability of the manifestations of dyslexia and the different characteristics of the students, it is advisable to assess the most suitable compensatory tools for the individual pathway in a personalised manner, also in relation to the specifics of the individual disciplines and the aims of the study courses.

EXAMPLE COMPENSATORY TOOLS

- Digital recorder
- PC with spell-checker
- Texts in digital format
- Speech synthesis programmes
- The presence of a tutor to act as a reader if it is not possible to provide examination materials in digital format
- Calculator
- Tables and forms
- Concept and mind maps
- Teaching materials in accessible formats (presentations, handouts, exercises), provided if necessary in advance of the lessons

EXAMPLE OF DISPENSATORY MEASURES

- Dividing the examination subject into several part-tests
- Giving preference to oral rather than written examinations, also taking into account the individual ability profile
- In the case of written examinations, check whether the chosen format (e.g. multiple-choice or closed-response tests) represents an obstacle and whether it can be replaced by other forms of written assessment; alternatively, provide for the quantitative, but not qualitative, reduction of the test itself, or the granting of additional time, up to a maximum of 30%, for the performance of the test
- Considering content rather than form and spelling in the assessment

TECHNOLOGICAL AND DIDACTIC AIDS

In a learning environment such as that of the University, it is particularly important to have aids that support students in their daily activities related to teaching (attending lectures and individual study) and in accessing information.

The use of aids must be allowed, when necessary, also in activities requiring oral or written production (in itinere tests, profit exams).

In almost all situations, the use of technological aids must be accompanied by the availability of accessible teaching materials: provide the student with the accessible format appropriate to his needs (digital format, etc.).

Digital whiteboards and audio/video recording systems of lessons can be a particularly useful tool to provide learning materials directly in digital format.

Materials can be transmitted in advance to students or uploaded later on teaching platforms (respecting accessibility and readability guidelines).

TECHNOLOGY LABORATORIES

These are spaces equipped with information and communication technologies, available to all students with dyslexia.

Assistive and compensatory technologies for communication, learning and access to information tools (hardware, software and web), present in the laboratories, can support the study and research moments of students with dyslexia and support them in finding the most appropriate compensatory tools.

MEDIATION WITH DELEGATE AND REFEREES

Each Athenaeum also establishes an administrative support structure (Delegate), supported by reference teachers for teaching and scientific structures (designated on the basis of the organisation of each Department).

Referee teachers and Delegate are points of reference for all students with dyslexia.

Key tasks assigned to the Delegate:

- Function as an interface between the university system and students;
- Connection with the university services
- Personalised accompaniment in itinere
- The organisation and administrative management for the provision of services and the monitoring of their effectiveness

TUTORING

Students with dyslexia can be accompanied by a tutor who will act as:

- Accompanying them to lessons
- Note-taking
- Intermediation with teachers
- Study support
- Support in the use of compensatory tools
- Reservation of places in lessons; administrative and secretarial

procedures

FORMS OF TUTORING

Specialised tutoring

- Professional educators trained in dyslexia
- Senior students such as PhD students, PhD students and postdoctoral fellows, properly trained and accompanied.

Peer tutoring

- Tutors from the same courses
- Tutors from related courses, accompanied and supervised.

PSYCHOLOGICAL COUNSELING SERVICE

- A listening and support space aimed at managing personal, relational and emotional problems, exam difficulties, anxiety, doubts about personal abilities linked to university study that may emerge during the academic course.
- Objectives: to support students in their overall personal growth by offering psychological help aimed at understanding the problem reported; clarifying the difficulties; activating the internal psychological resources needed to manage the difficulties and support change.

PEDAGOGICAL COUNSELING SERVICE

- Spaces for listening and helping relationships aimed at providing support in dealing with problems related to learning processes.
- Objectives: to offer support: in the acquisition and/or refinement of the study methodology; in the redefinition of one's study path; in the reading of specific needs in the direction of outlining a life project; in the identification of compensatory tools.

OUTGOING ORIENTATION

The Job Placement Service, which is present in all universities, accompanies undergraduates and graduates in the delicate phase of transition from University to the world of work, enabling them to acquire useful orientation tools for job placement.

The service also acts as an intermediary, facilitating the matching of job supply and demand and contact with companies.

SERVICE SATISFACTION QUESTIONNAIRE

In many Universities, students with dyslexia who use these services are asked to complete a satisfaction questionnaire at the end of the academic year.

This evaluation is an important opportunity for services to rethink and reshape their intervention.

Student's voice: the importance to know what dyslexia is and the role of the relationship

“The **professor-student relationship** in higher education can be one of mentorship, trust, and academia. In order to fight for this valuable relationship, we must adapt to the diverse population of higher education students, especially those with learning difficulties. A certain understanding of the ability and confidence of both parties is necessary to create an inclusive environment to thrive professor-student relationships. It is time for students to support with a plan and for professors to listen with a purpose. Changing the way we act will motivate the professor-student relationships that in turn will stimulate growth within higher education”.

"I wish to share my experience in order to support future students and improve the universities.

From my perspective, most of the professors don't know/know little about DSA, and they are not yet ready to help us.. (..)

For this reason, I had to manage by myself how to cope with everything, in class and at the university at large. The university should invest in training professors on how to help us and how to promote a safe and inclusive learning environment. (..)

I have to be honest. Dear professors, sometimes you made me feel frustrated, angry and in the wrong place.

Anxiety was a big issue during my academic experience. None could see understand it."

The image features a white background with dark blue geometric shapes in the corners. On the left, a large dark blue triangle points towards the center, with a smaller, lighter blue triangle nested within its lower-left corner. On the right, a similar dark blue triangle points towards the center, also with a smaller, lighter blue triangle nested within its lower-right corner.

ACTIVITY SESSION

Thank you for listening!