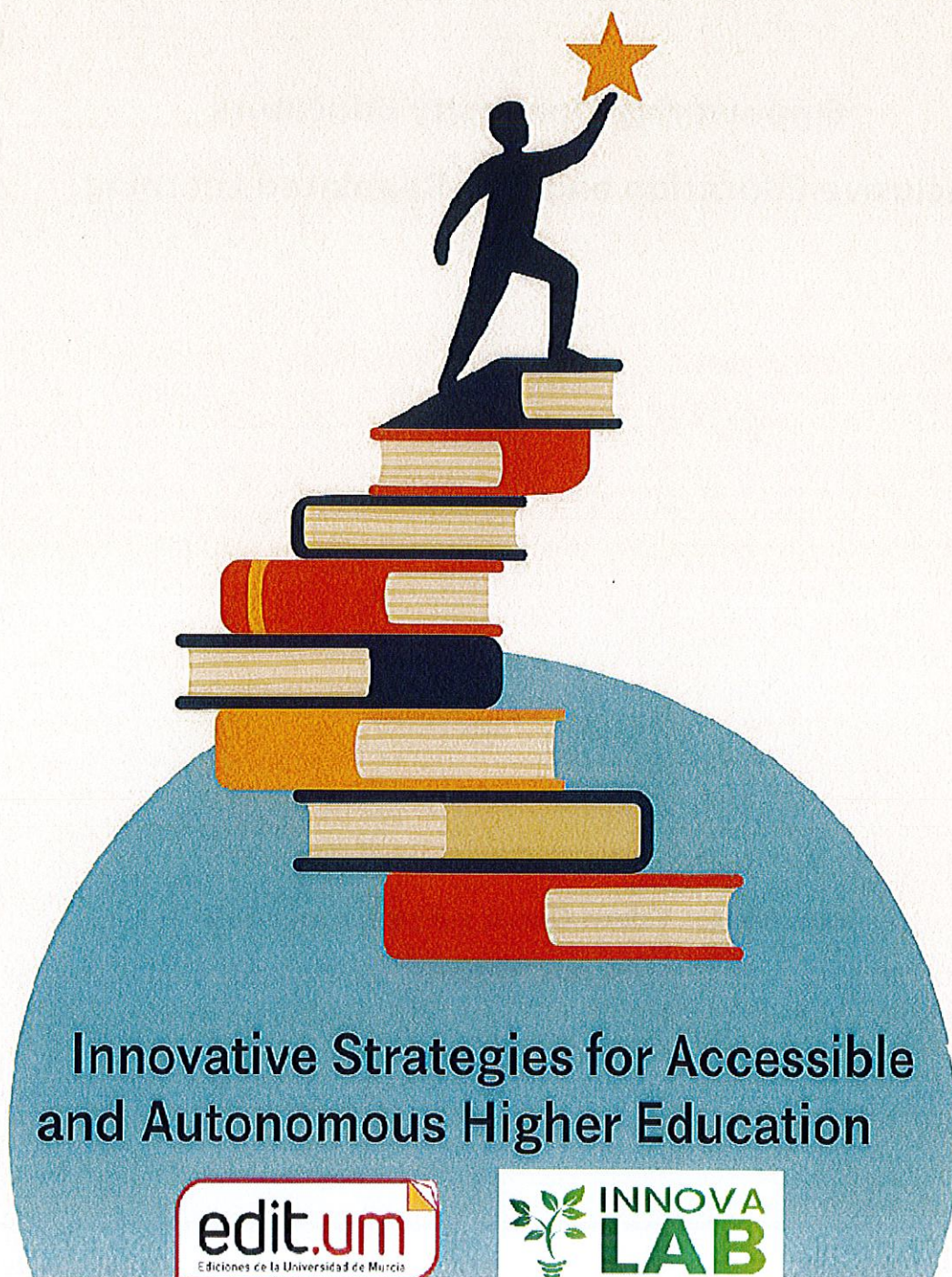# Empowering University Educators

INCLUSIVE EDUCATION AND SELF-REGULATED LEARNING

Innovative Strategies for Accessible and Autonomous Higher Education

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INNOVA LAB

Empowering University Educators

Inclusive Education and Self-Regulated Learning

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Editum. Ediciones de la Universidad de Murcia

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CHAPTER 1. UNIVERSAL DESING IN HIGHER EDUCATION

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1.   Teaching in Higher Education

The challenges posed by a university that is rightly increasingly open to all students have reshaped the perception of its role, transforming it from an elite institution to an opportunity for socio-cultural and economic advancement across all social strata. This change has necessitated a reorganisation of the university system and of individual institutions, with particular emphasis on the quality of teaching in order to reduce the dropout rate and to enable all students to experience real academic success as well as personal and professional fulfilment.

The OECD Report (2009) highlights an increase in the number of graduates across various European countries, as well as a general improvement due to the introduction of short-cycle, three-year degree programmes. These have contributed to reducing university dropout rates to 10%, in line with the Lisbon objectives for 2010. However, the issue of school and university dropout remains a major concern for the European Union, which has set additional benchmarks for the following decade to further increase the number of graduates in Europe.It is imperative to acknowledge that the transition from school to university signifies a pivotal phase for students, as it entails an augmented academic workload and challenges their motivational and strategic learning components (Moé, De Beni, & Cornoldi, 2003). The teaching-learning environment undergoes significant changes, as does the relationship between space and individuals; large lecture halls and macro-groups often foster invisibility and anonymity rather than encouraging personal responsibility.

The issue of academic success cannot be addressed solely by focusing on students' individual efforts; rather, it is necessary to restructure the university experience and educational offerings more effectively. This necessitates a re-evaluation and optimisation

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[1] The entire chapter is the result of the joint work of the authors. In particular, Marta Sánchez Utgé is the author of the paragraphs 2 "Universalization of teaching" and 3 "Universal Instructional Design (UID)" - except for subparagraph 1 "Creating welcoming classrooms" of which Angela Magnanini is the author, María Jesús Rodríguez Entrena and María Ángeles Fernández Vilar are the authors of paragraph 3 "Universal Design for Learning" and Pasquale Moliterni is the author of paragraph 1 "Teaching in higher education" and 4 "Challenges and opportunities".

of knowledge organisation, ensuring that students develop a robust grasp of fundamental concepts and developmental frameworks while paying close attention to teaching methodologies and approaches (Moliterni, 2011, p. 18).

In the context of an expanding and diversifying student population, it is imperative to address the organisational aspects of university teaching, with a view to establishing a positive, engaging and responsible learning environment. Such an environment should be designed to support the development of learning processes and educational success (Moliterni, 2011, pp. 18-19).

It is therefore erroneous to regard the field of didactics as a set of methodologies in isolation; rather, it must be regarded as a complex system. Learning is a personal reworking, but the result of interactions between subjects, between the subject and culture, language, context, texts and representations. The cultural object is instrumental in distinguishing and characterising the institutional educational action of schools and universities. These institutions are entrusted with the responsibility of cultivating educational processes that align with the cultural heritage deemed pertinent to the evolution of individuals, societies, and scientific advancement.

Consequently, educational action cannot be regarded as mere transmission of this heritage; rather, it encompasses the selection and transformation of relevant scientific cultural objects into training, in a process of continuous mediation that renders didactics an epistemology (Damiano, 1993).

The teacher bears an ethical responsibility that exerts a significant impact on the student, particularly in the contextualisation and reorganization of cultural artefacts to be taught (Prairat, 2005), ensuring that students can learn and internalize them in a meaningful way (Ausubel, 1968).

According to Cannon and Newble (as cited in Coggi, 2005, p. 260 ff.), learning outcomes are contingent on the approach to learning, which involves cognitive, metacognitive, and motivational variables employed in the process of acquiring knowledge. Additionally, they are influenced by students' conceptions and characteristics, including their opinions, prior experiences, abilities, motivational levels, and cognitive styles. Furthermore, the learning context plays a crucial role, encompassing teaching practices, the course's placement within the curriculum, the availability of facilities and services, the degree of academic

engagement, the broader educational framework, and connections with the professional and social spheres.

Didactics is the science of mediation centered on action and requires a mindset oriented toward mediation. It cannot be reduced to lectures alone but necessitates attention to interpersonal relationships (pedagogical mediation processes), the selection and preparation of study materials and tools, and evaluation as a continuous regulation and self-regulation of teaching actions. The professional responsibility of educators (as well as the governance system of the university institution) lies in how knowledge is conveyed and how meaningful and engaging didactic contexts are activated—"honest forms" that help understand the place of an idea, an event, or a fact within a broader structure of knowledge (Bruner, 1997, p.10)—and are suitable for responding to students' specific needs, allowing them to identify their developmental tasks and build a life project that integrates personal fulfillment with a commitment to social and environmental improvement. The use of conceptual maps facilitates the structural modification of knowledge organization through the construction of conceptual frameworks (Novak, 1998), enabling the reconstruction of the dynamic nature of study content. Didactic effectiveness increases when developed within a community of practice (Wenger, 1997).

The academic context is fundamental, encompassing the teacher-student relationship, the availability, enthusiasm, and consideration of instructors toward students, the social climate within classrooms and the university, the clarity of objectives, the accessibility and usability of knowledge, the promotion of self-regulated learning, and the adoption of appropriate assessment methods (Ramsden, 1979). Furthermore, the context is an instituting factor (Canevaro, 1983), shaped by the co-responsible participation of its members in its continuous improvement. It is essential for the institution (and the educator) to establish conditions for the widespread practice of individualized and personalized strategies (setting, streaming, mastery learning), considering, in the development of study programs, the timing and pace of knowledge assimilation, flexible and structured attendance models, opportunities for dialogue and understanding between students and faculty, seminars and interdisciplinary hermeneutic workshops, internships, and apprenticeships to bridge theoretical and practical knowledge.

The implementation of tutoring and peer-tutoring systems, cooperative learning structures, and small group discussions is imperative to facilitate the deepening of key ideas (knowledge, theories, skills, and competencies) of each course and their interconnections.

The act of posing problems has been shown to foster problem-solving skills, enhance comprehension abilities, and consequently improve long-term retention (Covington, 2000). This is known as the mediation of use from Goal Theory. The availability of spaces and tutorial figures (including peer tutors) is therefore essential, as they enable hands-on, laboratory-based, and cooperative activities.

The didactic mediation processes that emerge because of these teaching actions are the product of the joint effort of teachers and students in engaging with cultural objects. The educator's role transcends the mere transmission of content or the facilitation of learning in students; rather, they are instrumental in creating a pedagogical, didactic, and organisational mediation space. Within this space, students are empowered to hone their skills and master cultural learning through the utilisation of methods and tools. Consequently, teacher training should be conceptualised within the paradigm of didactic research as a reflective and self-reflective practice aimed at refining and enhancing teaching methodologies. The overarching objective is to construct accessible and usable scientific knowledge that promotes active, engaging, and responsible student participation, leading to academic success and fostering competent autonomy within a collective social civitas (Goodlad, 1997), balancing identity and responsibility. The role of the mediator is to facilitate the formulation of constructive and participatory solutions within pathways that integrate reality and symbolism. This encompasses not only architectural and urban accessibility but also cultural accessibility, which is the true source of humanisation and the promotion of personal and social development. It is achieved by activating pedagogical, didactic and educational mediation processes.

It is imperative to conceptualise a systemic educational model that is informed by the interplay of pedagogical mediation processes (with a focus on cultivating positive relational and interpersonal dynamics that are stimulating and proactive), didactic mediation processes, and organizational mediation processes. This model should place significant emphasis on the organisation of teaching activities as instituting actions that materialise the educational process. From the perspective of inclusive education and Universal Design (UD), it is particularly necessary to activate didactic mediation processes to select, transform, and present knowledge through active, iconic, and analogical methods—leveraging role-playing and ICT tools, which can offer opportunities for simulations of real and even embodied experiences—as well as symbolic methods. Through the careful mediation actions of the instructor, each student should be able to rely on the knowledge

construction modes most suited to them. The implementation of didactic mediation processes primarily entails the identification of specific and interdisciplinary knowledge that fosters the development of skills and competencies aimed at enhancing autonomy and supporting students in defining their developmental tasks, ultimately facilitating their socio-professional integration within their life project. This necessitates educators to transform and present knowledge using a broad range of didactic mediators: active mediators: direct experience and the use of materials and tools within a laboratory-based didactic approach; iconic mediators: the use of images, diagrams, graphs, and maps; analogical mediators: the use of playful forms, historical-situational representations and narratives in theatrical form, role-playing, videos, software, and information and communication technologies (ICT); and, symbolic mediators: concepts and codes, theories, texts, textual comparisons, participatory lectures — these comprise the entire spectrum of symbolic systems that have enabled humanity to develop and represent scientific knowledge in a shared and shareable form. The result is an ever-expanding process of human understanding of life's realities and their interconnections.

In this regard, the virtual and real laboratories of INNOVA-LAB can become an important point of reference.

2.   Universalization of teaching

Since the mid-20th century, universities have undergone a period of transformation and innovation in order to adapt to societal changes. The democratisation of access to higher education, which began in the 1960s and 1970s, resulted in tertiary education becoming accessible to the entire population rather than being reserved for privileged classes. This democratisation of access brought about a paradigm shift in the perception of universities, transforming them from institutions reserved for the elite into opportunities for socio-economic and cultural advancement for individuals across all social strata (Moliterni, 2011, p. 15). In the decades that followed, beginning in the 1990s, there was a notable surge in advocacy for inclusive education. This was accompanied by two significant declarations from the United Nations (UN): the Jomtien Declaration in 1990 and the Salamanca Declaration in 1994. These declarations served to further ignite the ongoing discourse surrounding the access to education for individuals with disabilities within conventional educational settings. Prior to this, few countries had embraced the concept of inclusive education, which guaranteed the right to education for students with disabilities in regular schools. Notably, "*Italy was the first to close special schools in order*

to mainstream students with disabilities, in 1977" (UNESCO, 2020, p. 51). This new scenario challenged the traditional education system, which was designed for students without special educational needs. The challenge was further compounded by the necessity to redefine the professional competencies of educators, emphasising the importance of identifying individuals with the specific skills required to cater to the diverse educational needs of students with disabilities. This shift in focus necessitated a paradigm shift in educational policies and practices, with the objective of fostering integration and inclusion processes (Canevaro and Gaudreau, 1988; Canevaro and Goussot, 2006; Ainscow, Farrell and Tweddle, 2000; de Anna, 1998, 2014).

The democratisation of universities and the promotion of inclusive education have become pivotal in addressing the growing demand for access to higher education among students with special educational needs. In the 2000 Lisbon Summit, the European Union committed to the development of a Knowledge Society at the community level, with the aim of enhancing the quality of life for individuals across all member states. It was recognised that general and universal education for all is fundamental for developing autonomous and independent individuals capable of making a constructive and responsible contribution to societal development. With the European Qualifications Framework (2017), emphasis was placed on the interactions between knowledge, skills, responsibility, autonomy, and competence. Pedagogical and didactic research, from an inclusive perspective, identifies instructional design as the fundamental competence that every educator must develop throughout their professional life. This has prompted a substantial debate on the concept of competence, progressively shaping it not only in a strictly applied-professional sense but increasingly in pedagogical, functional, and behavioural terms—especially in attitudinal and value-based dimensions (Bloom, 1964; Le Boterf, 1994).Precisely due to this emerging need, the first studies on Universal Design in educational and academic contexts began to take shape. Notable scholars such as Chickering and Gamson (1987) and Silver, Bourke, e Strehorn (1998) drew inspiration from Ronald Mace's contributions to Universal Design, pioneering the adaptation of this concept to the educational realm. Their work aimed to enhance the accessibility of learning products through a design approach that acknowledges and values human diversity.

The expression *Universal Design* was coined by the architect R. Mace in the 1980s, claiming that is *"the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design"* (The Center for

Universal Design, 1997). Mace and his collaborators identified seven principles that guide Universal Design:

1. Equitable use: The design is useful and accessible to people with diverse abilities.

2. Flexibility in use: the design accommodates a wide range of individual preferences and abilities

3. Simple an intuitive use: Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

4. Perceptible information: The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

5. Tollerance for error: The design minimizes hazards and the adverse consequences of accidental or unintended actions.

6. Low physical effort: The design can be used efficiently and comfortably and with a minimum of fatigue.

7. Size and space for approach and use: Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Each of these principles is structured into a set of guidelines that assist designers in creating accessible and usable products (Story, Mueller, and Mace, 1998).

The concept of Universal Design gained further recognition with the adoption of the United Nations Convention on the Rights of Persons with Disabilities (CRPD, 2006). According to **Art. 2**, Universal Design is meant to be *"means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed."*.

The definition adopted by the UN Convention, compared with that provided by Mace, presents two new elements: services and programs. Those items extend the field of Universal Design concept, from the physical-environmental one initially proposed in UD, to embrace all the areas of people's lives through what may be educational, welfare, health,

etc. services and the training programs, job placement, sports and leisure time, culture, etc.

Also, UN declaration has championed the UD by requesting that the signatory states to commit *"to undertake and to promote research and development of assets, services and equipment that are universally designed"*. (**Art. 4, letter f**). Since the education is a service offered to all citizens, teachers have the responsibility to design universally their teaching. Nowadays we must think and act in an inclusive perspective considering the needs of all students by providing them pathways that meet their needing without denying specificities.

The opening to new horizons of UD has a direct impact on education, particularly in higher education, on instructional design. The Universal Design seems to be a valid approach that can activate a wide range of modes of self-analysis and reflection on teaching action that can help to raise teachers' skills and bring them closer to a more inclusive view of design. Following the idea of universal design that tries and helps developing an inclusive teaching to provide meaningful and useful learning opportunities for all students, different approaches were developed. The main ones are: Universal Instructional Design (UID) (Silver et al, 1998; Higbee, 2001), Universal Desing for Learning (UDL) (Rose e Meyer, 2002); Universal Design for Instruction (UDI) (McGuire, Scott and Shaw, 2003); and, Universal Design in Education (UDE). (Burgstahler, 2012; Bowe, 2000).

The overarching objective of these approaches is to enhance the accessibility and inclusivity of learning environments. This is achieved through a reinterpretation of Mace's original principles or the development of novel ones that are tailored to specific educational contexts. However, an analysis of the scientific literature reveals frequent confusion in the use of these terms, often treating them interchangeably despite their distinct meanings (Mangiatordi, 2024).

In the research conducted within the InnovaLab project, a decision was taken to refer specifically to Universal Instructional Design (UID). A detailed analysis of the principles underpinning these diverse approaches indicates that UID is particularly well-suited to the university setting. From our perspective, UID provides general guidelines without being overly prescriptive, allowing educators to make informed and targeted choices. While it incorporates aspects of UDL, UID avoids the complexity of UDL's framework, which may be perceived as too rigid, restrictive, or discouraging for university instructors.

In light of these considerations, the following pages will briefly present both UID and UDL, as UID was the framework adopted by our research group, while UDL remains the most widely recognised and utilised framework, particularly in school education.

3. Universal Instructional Design (UID)

Silver, Bourkee Strehorn (1998) conducted a study involving 13 faculty members from the University of Massachusetts with the aim of defining Universal Instructional Design (UID) and its application, and of identifying the barriers to its implementation. Among the findings, it was posited that "First, the entire university culture must be viewed as part of this process" (p. 50). This aspect is crucial in ensuring that all students, including those with disabilities, can engage in more effective and successful learning experiences.

It is therefore essential to reflect on the role of university culture and its mission, not only in contributing to the personal development of each student, but also in preparing competent individuals capable of making a professional contribution to societal development in all areas of life. If this is one of the fundamental responsibilities of the university, it becomes essential to identify ways to initiate a cultural shift in higher education, paying greater attention to factors that can enhance and transform university teaching. This necessitates a critical examination of the roles and competencies of university faculty: Is it sufficient for them to be experts in their research fields, or must they also possess teaching competencies? Furthermore, it is necessary to determine the precise nature of these competencies. Merely knowing one's discipline is not enough to teach it effectively; rather, it is essential to develop knowledge about how to teach it. The professional identity of an educator, therefore, pertains to the ability to "know how to teach." Consequently, it is necessary to strengthen the pedagogical and didactic culture of all faculty members, including those in higher education. However, instructional design and the development of teaching strategies are often taken for granted. A few decades ago, this was less problematic, as classrooms were composed of smaller and more homogeneous groups. Today, with universities becoming more open to diverse student populations, classrooms are far more heterogeneous, and the differences among students demand greater attention and professionalism from faculty. Educators must ensure that their teaching is accessible to all students—without exception. This critical issue was already identified by Silver et al (1998), who stated that "UID places accessibility issues as an integral component of all instructional planning" (p. 47). From this perspective, the UID approach seeks to reduce or eliminate "the need to provide individualized academic

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accommodations, and particularly those that publicly identify or segregate students with disabilities. [...] may cause educators to reconsider teaching methods that tend to unnecessarily exclude some students" (Goff & Higbee, 2008, pp. 1-2).

This approach has a twofold purpose:

- The elimination of the labelling frequently associated with teachers' prejudice against diverse pupils (in terms of culture, religious orientation, sexual identity, and disabilities, etc.).
- The initiation of a reflection on university teaching.

For this reason, this approach offers flexible guidance to design courses and to take care of the relationships with students and to study deeper pedagogical and didactic aspects.

The following section presents the results of the study conducted by Higbee and Goff (2008) at the University of Minnesota. Utilising the seminal contributions of Chickering and Gamson (1987) and Fox et al. (2003), the present authors have advanced eight principles of UID, as outlined below:

3.1. Creating welcoming classrooms

Establishing a positive and welcoming classroom climate is a fundamental aspect of successful learning. While many studies focus on classroom climate in schools, fewer address the climate in university classrooms. However, a university professor's work should always begin with fostering student well-being and a positive classroom atmosphere, as this impacts both the learning process and the class's social dynamics.

Professors should always welcome students with a smile, maintain a positive and encouraging attitude, and use clear and inclusive language to prevent any form of discrimination. They should also occasionally pause their lectures to check in with students, asking how they are doing and whether they feel they are in an optimal learning environment.

Classroom climate is a key element of classroom management (Everton & Weinstein, 2006), which should not only focus on maintaining discipline or preventing problematic behaviors but also on creating a fulfilling socio-relational environment.

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Effective teaching and learning cannot take place in poorly managed classrooms (Jones & Jones, 2012; Marzano, Marzano, & Pickering, 2003; Van de Grift, Van der Wal, & Torenbeek, 2011). Effective classroom management strategies support and facilitate effective teaching and learning. Effective classroom management is generally based on the principle of establishing a positive classroom environment encompassing effective teacher-student relationships (Wubbels, Brekelmans, Van Tartwijk, & Admiraal, 1999). Evertson and Weinstein (2006) define classroom management as "the actions teachers take to create an environment that supports and facilitates both academic and social-emotional learning" (pp. 4-5). This definition concentrates on the responsibility of the teacher and relates the use of classroom management strategies to multiple learning goals for students.

In this regard, it may be useful for the professor to integrate various approaches and tools to meet the needs of all students. A particularly valuable tool is Moreno's Sociogram (1952), which allows the professor to map out the class's social relationships and intervene to foster better interactions, as well as a climate of encouragement, support, and collaboration within the classroom. The Sociogram can provide useful insights into which strategies to adopt, such as incorporating small group work or cooperative learning activities. Additionally, it may be beneficial for professors to dedicate part of their early lessons to activities that promote acquaintance, trust, and collaboration (Magnanini, 2018). Preparing the class for teamwork and cooperation is an essential prerequisite for initiating an effective teaching-learning process.

Chiaramente, tale strumento e modalità di intervento, diventa di difficile attuazione con classi molto numerose se il docente, come spesso accade, deve lavorare da solo.

3.2. Determining essential course components

Determining the essential components of a course is fundamental to ensuring effective, targeted, and coherent learning experiences. According to the *Backward Design* framework (Wiggins & McTighe, 2005), instructional design should begin with clearly defined learning objectives, followed by the selection of appropriate content, teaching methods, and assessments. This approach ensures alignment between learning goals and instructional strategies, leading to improved student engagement and achievement. Moreover, the *Cognitive Load Theory* (Sweller, 1988) emphasizes the importance of selecting essential course content to prevent cognitive overload, which can hinder knowledge acquisition. By focusing on key concepts and eliminating unnecessary information,

educators can optimize students' cognitive resources and enhance learning efficiency. Another crucial framework, *Constructive Alignment* (Biggs, 1996), highlights the necessity of ensuring coherence between learning outcomes, instructional activities, and assessments. Research shows that well-structured courses incorporating active learning strategies, formative assessment, and timely feedback significantly enhance student performance and retention (Fink, 2013). The *Tuning* project aligns with these educational principles by providing a methodology for identifying core subject-specific and generic competencies. It helps institutions define key course components based on international benchmarks while allowing for flexibility in national and institutional contexts. By focusing on competency-based learning, *Tuning* ensures that students acquire not only knowledge but also the skills needed for their academic and professional development.

The identification of essential course components should be based on evidence from educational research. Reliable sources, such as:

- *Educational Research Review* and the *Journal of the Learning Sciences*, provide valuable insights into effective course design.
- Organizations like the *American Educational Research Association (AERA)* also offer research-based recommendations for developing inclusive and impactful learning environments.
- By integrating these principles and leveraging scientific evidence, educators can design courses that not only convey essential knowledge but also foster critical thinking, engagement, and long-term learning outcomes.
- The *Tuning* project reinforces this approach by providing a structured framework for competency-based learning, ensuring that courses are aligned with both academic standards and societal needs.

3.3. Communicating clear expectations

Communicating clear expectations in instructional design is fundamental to enhancing student motivation, engagement, and overall learning outcomes. When students have a precise understanding of course objectives, assessment criteria, and instructor expectations, they are more likely to take ownership of their learning process and perform effectively (Hattie, 2009). Research has consistently shown that clarity in instructional communication reduces student anxiety, fosters self-efficacy, and improves academic performance (Bandura, 1997; Freeman et al., 2014). Transparent expectations not only

help students navigate coursework with confidence but also contribute to a more equitable learning environment, particularly benefiting underrepresented and first-generation students (Winkelmes et al., 2016). In a rapidly evolving educational landscape, where digital learning platforms and hybrid instruction are increasingly prevalent, clearly articulated expectations are more critical than ever in ensuring consistency and student success (Nilson, 2016).

Why Clear Expectations Matter

Clear expectations serve multiple purposes in education. According to Self-Determination Theory (Deci & Ryan, 1985), students are more motivated when they understand what is expected of them and how their performance will be evaluated. Expectations provide a sense of direction, reducing anxiety and increasing self-efficacy (Bandura, 1997).

Moreover, the Transparency in Learning and Teaching (TILT) framework (Winkelmes et al., 2016) emphasizes that explicitly outlining expectations—such as assignment purposes, required steps, and assessment criteria—leads to better student outcomes, particularly for students with special needs education. By making learning processes visible and understandable, educators can bridge gaps in student preparedness and foster equitable learning experiences.

How to Effectively Communicate Expectations

To ensure clarity, educators should:

- Define Learning Outcomes Clearly – Using Bloom's Taxonomy (Anderson & Krathwohl, 2001) to articulate objectives in measurable terms (e.g., "analyze," "synthesize," "evaluate") helps students understand expected competencies.
- Use Detailed Rubrics – Providing grading rubrics with clear performance levels improves transparency and helps students self-regulate their learning (Panadero & Jonsson, 2013).
- Provide Examples of Work – Showing high-quality exemplars reduces ambiguity and allows students to align their efforts with expected standards (Sadler, 2002).
- Reinforce Expectations Through Multiple Channels – Communicating expectations in syllabi, LMS platforms, and classroom discussions ensures consistent messaging (Nilson, 2016).

- Encourage Student Questions and Feedback – Allowing students to seek clarification promotes active engagement and fosters a supportive learning environment (Brookhart, 2013).

3.4. Using diverse teaching methods

It is very important to design teaching methods that consider different ways of knowing and learning, skills, experiences and backgrounds knowledge of students. Teaching choices should aim to foster the development of metacognitive skills to make students protagonists of their own learning process. Examples of using diverse teaching methods are (but not limited to): to propose activities based on active learning such as research, problem-solving, projects to be carried out in cooperative groups; to embody a wide range of teaching strategies like, e.g., simulations, dialogic approaches, peer education, flipped classroom, cooperative learning, gamification, computer-based instruction, experiential learning. Integrating diverse teaching methods in instructional design is essential for addressing different learning styles, increasing student engagement, and improving overall learning outcomes. Research indicates that a one-size-fits-all approach to teaching is ineffective because students possess varied cognitive abilities, prior knowledge, and learning preferences (Felder & Silverman, 1988). By incorporating multiple instructional strategies, educators can create more inclusive and dynamic learning environments that cater to diverse student needs (Tomlinson, 2014). According to *Universal Design for Learning (UDL)* principles (CAST, 2011), diverse teaching methods help remove barriers to learning by providing multiple means of representation, engagement, and expression. This approach enhances accessibility and supports students with different backgrounds, abilities, and learning challenges. Additionally, active learning techniques, such as problem-based learning (Hmelo-Silver, 2004) and collaborative learning (Johnson & Johnson, 2009), have been shown to significantly improve retention and critical thinking skills.

Some ideas on how **to Implement Diverse Teaching Methods:**

- **Blended Learning** – Combining face-to-face instruction with digital resources allows students to learn at their own pace while benefiting from interactive classroom experiences (Graham, 2006).

- **Differentiated Instruction** – Adapting content, process, and assessment based on students' readiness levels and interests ensures personalized learning experiences (Tomlinson, 2014).
- **Active Learning** – Techniques like case studies, debates, and simulations encourage student participation and deepen understanding (Bonwell & Eison, 1991).
- **Collaborative Learning** – Encouraging teamwork through peer discussions and group projects fosters critical thinking and social skills (Johnson & Johnson, 2008).
- **Experiential Learning** – Hands-on activities, such as lab experiments and fieldwork, connect theoretical knowledge to real-world applications (Kolb, 1984)

By integrating these methods, educators create an adaptive learning environment that enhances motivation, engagement, and knowledge retention. Studies confirm that diverse teaching strategies lead to higher academic achievement and better preparation for real-world problem-solving (Prince, 2004).

3.5. Providing natural support for learning

Learning supports are essential resources, strategies, and practices designed to eliminate barriers and promote engagement in teaching and learning. According to the *Universal Instructional Design (UID)* framework, these supports should be as natural as possible, meaning they should be integrated seamlessly into the learning environment, readily available, and accessible to all students (Burgstahler, 2015). The goal is to create an inclusive educational setting where students of diverse abilities and backgrounds have equal opportunities to succeed academically.

Natural supports in learning go beyond mere accommodations; they involve designing instructional materials and activities that inherently facilitate multiple means of access. This approach aligns with *Universal Design for Learning (UDL)*, which emphasizes providing multiple means of representation, engagement, and expression to cater to different learners (CAST, 2011; Rose & Meyer, 2002). Instead of relying solely on traditional textbooks or lectures, educators should design courses that allow knowledge to be accessed through different learning mediators—such as active, iconic, analogical, and symbolic representations (Damiano, 1993; Moliterni, 2013). This multi-modal approach ensures that learning materials are comprehensible and engaging for all students, regardless of their cognitive or sensory abilities.

For instance, students benefit from varied instructional formats such as printed, audio, and digital materials, which provide alternative ways to engage with course content. Additional examples of natural learning supports include:

- **Multimodal content delivery** – Combining textbooks, audiobooks, videos, conceptual maps, and graphic organizers to reinforce learning (Mayer, 2009).

- **Assistive technologies** – Incorporating tools such as screen readers, speech-to-text software, and Braille resources to support students with disabilities (Edyburn, 2013).

- **Linguistic accessibility** – Providing materials in sign language, simplified texts, and multilingual resources to accommodate students with different language proficiencies (Burgstahler, 2008).

By embedding natural supports into instructional design, educators not only foster greater accessibility but also enhance student autonomy, motivation, and engagement. This approach aligns with contemporary educational paradigms that emphasize equity, inclusion, and lifelong learning skills necessary for diverse and evolving learning environments.

3.6. Creating multiple means for demonstrating knowledge

Creating multiple means for demonstrating knowledge is an essential principle in effective instructional design, particularly when combined with *formative assessment*. This approach acknowledges the diverse ways students process, understand, and express what they have learned. By offering varied assessment methods, educators can provide students with equitable opportunities to showcase their understanding, supporting both their strengths and addressing their challenges (CAST, 2024). This aligns with the *Universal Design for Learning (UDL)* framework, which emphasizes multiple means of representation, engagement, and expression (Rose & Meyer, 2002).

Formative assessment, which occurs throughout the learning process, plays a critical role in shaping how students demonstrate their knowledge. Unlike summative assessment, which typically measures the outcome, formative assessment focuses on continuous feedback that guides students' learning. By incorporating diverse forms of assessment, such as written reflections, multimedia projects, peer reviews, and oral presentations,

educators can provide a more holistic view of student learning, ensuring that all students can demonstrate their knowledge in a way that suits their learning preferences (Mayer, 2009).

For example, students who excel in visual or hands-on learning might better express their understanding through project-based assessments or creating visual representations like infographics or models, while others may prefer written reports or oral presentations. Providing these varied opportunities fosters deeper engagement and understanding (Gulikers et al., 2004). By utilizing formative assessments in these different formats, educators can offer ongoing support, provide timely feedback, and adjust instructional methods as needed, promoting a more personalized learning experience (Tomlinson, 2014).

Moreover, formative assessment enables educators to assess students' progress over time and adjust instructional strategies in real time, fostering an adaptive and responsive learning environment. This iterative process enhances motivation, as students can track their progress and make improvements based on constructive feedback, rather than waiting until the end of the course (Black & Wiliam, 2009). For example, a teacher might use digital quizzes, group discussions, or concept maps as ongoing assessments to gauge understanding and identify areas that need further clarification, providing immediate opportunities for intervention or enrichment.

Importantly, this approach also promotes inclusivity. Offering multiple formats for assessment, such as video, digital portfolios, or spoken word, ensures accessibility for students with disabilities, as well as those with different cultural and linguistic backgrounds. By integrating multiple means of demonstrating knowledge, educators not only increase fairness in assessment but also contribute to a more dynamic and engaging learning experience that benefits all students.

Ultimately, combining multiple means for demonstrating knowledge with formative assessment leads to a more inclusive, personalized, and effective learning environment that supports student growth and ensures that all learners have the chance to succeed.

For Example, a teacher can use formative assessment strategies such as:

- Exit Tickets: At the end of a lesson, students could write a short summary or answer a specific question about the material they just learned. This provides immediate

insight into how well students understand the content and allows the teacher to adjust the next lesson based on their responses.

- Peer Review: Allowing students to review and give feedback on each other's work not only fosters collaboration but also helps students engage critically with the material. This practice benefits diverse learners by encouraging different ways of thinking and expressing ideas.

- Digital Quizzes: Using tools like Kahoot or Google Forms, teachers can create quick quizzes that provide instant feedback. This is particularly helpful for students who need frequent check-ins on their understanding or students with special needs who may benefit from digital tools that provide additional support.

- Multimodal Projects: Rather than relying solely on written reports, teachers can offer students the option to present their knowledge through multimedia projects, such as videos, podcasts, or visual diagrams. This gives students the opportunity to demonstrate their understanding in a format that aligns with their strengths, whether they are more verbal, visual, or kinesthetic learners.

3.7. Providing constructive feedback

Providing constructive feedback is a fundamental element in instructional design as it helps guide students toward greater understanding and improvement. Feedback is not merely an evaluative tool but a formative process that fosters student growth and enhances learning outcomes. When given effectively, feedback can be a powerful motivator, helping students recognize their strengths and areas for development (Hattie & Timperley, 2007). Feedback, according to Hattie and Timperley (2007), is a tool that promotes learning, understood as a process of knowledge construction, "in una operazione comunicativa a più strati, tra docente e discenti, entro cui all'interazione dialogica segue la decisione e l'azione e da lì, nuovamente, si passa al dialogo e a nuove cicliche stratificazioni conoscitive" (Cappuccio & Compagno, 2021, p. 463), and not simply an evaluation of the student's performance. This description highlights the idea that feedback is not a one-way judgment, but rather a dynamic, dialogic process that involves multiple layers of interaction between the teacher and students. Formative assessment, when combined with constructive feedback, not only helps students but also supports the teacher's development. Feedback allows educators to gain insights into students' learning progress, helping them re-design their teaching practices to meet the evolving needs of the group. By

continuously adapting their instructional strategies based on feedback, teachers can improve the quality of their teaching (Boud & Molloy, 2013).

Incorporating feedback into instructional design involves various strategies, all of which emphasize active engagement and support for diverse learners. For example, written feedback on assignments can highlight strengths and offer suggestions for improvement, ensuring that students are aware of both their achievements and their next steps. However, feedback should not be limited to written comments alone. Oral feedback, peer feedback, and self-assessment opportunities can complement written feedback by offering multiple perspectives and reinforcing learning (Sadler, 2010). Moreover, formative feedback can be integrated into the learning process by providing continuous support. For instance, educators can use in-class activities, quizzes, and group discussions to monitor students' understanding and offer feedback during the learning process. This timely, ongoing feedback helps students stay on track and adjust their strategies before reaching the final assessment (Black & Wiliam, 2009). Feedback is most effective when framed positively and encouragingly. For students with diverse needs, such as those with disabilities or English language learners, providing feedback that is clear, affirming, and accessible is particularly important. Teachers can use tools like visual aids, graphic organizers, or digital platforms to ensure that feedback is understood and actionable for all students (CAST, 2018). Furthermore, feedback should focus on the process rather than just the outcome, reinforcing effort and strategies used by the student rather than labeling them based on performance alone (Dweck, 2006).

By integrating constructive feedback into instructional design, educators foster a learning environment that encourages reflection, growth, and continuous improvement. Constructive feedback not only enhances academic success but also promotes essential skills like self-regulation, resilience, and critical thinking, all of which are crucial for lifelong learning.

3.8. Promoting interaction

Promoting interaction in the classroom contributes to creating a positive and inclusive learning environment that fosters student engagement and success. Interpersonal relationships play a key role in establishing such an environment, as they help to create a supportive and motivating atmosphere for learning. As D'Alonzo (2020, p. 138) emphasizes, "La qualità dell'interazione personale con gli allievi, infatti, gioca un ruolo primario nel

costituire un clima favorevole all'apprendimento" ("The quality of personal interaction with students plays a primary role in creating an environment conducive to learning"). This statement underscores the importance of interpersonal communication between teachers and students in promoting learning.

Encouraging interaction among faculty members, students, and between faculty and students helps to build a community where learners feel safe, valued, and motivated to participate. A key aspect of promoting interaction involves fostering dialogue, encouraging discussions, and supporting collaborative work, all of which are known to enhance student engagement. According to Vygotsky's (1978) sociocultural theory, social interaction is foundational for cognitive development, particularly when learners engage in collaborative problem-solving or discussions that allow them to scaffold each other's understanding. One practical way to promote interaction is by:

- Assigning group work, which requires students to work together and contribute a variety of roles and skills.
- Collaborative tasks, such as debates or peer teaching, can stimulate critical thinking, increase motivation, and build social and communication skills among students.
- Cooperative work is beneficial for learning, as it allows students to discuss and negotiate ideas, thus deepening their understanding of the subject matter (Johnson & Johnson, 1989).

Another crucial concept in promoting interaction is the role of *mediazione pedagogica* (pedagogical mediation). In the classroom, teachers act as mediators of learning, facilitating interactions that support students' cognitive and social development. Pedagogical mediation involves providing guidance, scaffolding students' learning through meaningful interactions, and helping them navigate challenges in understanding (Bruner, 1996). Through thoughtful mediation, teachers can adjust their teaching strategies to meet students' needs, ensuring that each learner has the opportunity to succeed. This interaction between teacher and students, grounded in the principles of pedagogical mediation, supports a deeper understanding of the content and promotes a collaborative learning environment.

4. Universal Design for Learning (UDL)

Universal Design for Learning (UDL) is based on principles from cognitive neuroscience, with the goal of developing flexible learning environments that cater to the diverse ways students learn. According to Scott (2018), UDL serves as a framework for shaping educational practices by offering flexibility in how information is delivered, how students show their understanding, and how they engage with the material. It also works to eliminate barriers in instruction, providing essential accommodations, support, and challenges, all while maintaining high expectations for all students, including those with disabilities.

First introduced in 2008, the UDL Guidelines have been continuously refined based on new research and insights from educators. CAST has released multiple versions, with the most recent, UDL Guidelines 3.0 (CAST, 2024).

The UDL framework centers around three key principles: engagement, representation, and action and expression. These principles guide educators in making adjustments that best support diverse learners:

- Multiple Means of Engagement: To engage students, teachers must appeal to both their attention and their motivation. This means providing learning experiences that are meaningful, relevant, and authentic. Recognizing that each student is unique, teachers can support them by teaching skills that help them persevere, reflect on their learning, and cope with challenges. A classroom designed with UDL principles allows students to practice and refine these skills as they work toward their goals.

- Multiple Means of Representation: Traditional lessons often present information in one form, whether through lectures, videos, or hands-on activities. However, students vary in how they absorb and process information. By offering different ways to access content, educators empower students to customize their learning experience to suit their individual strengths and needs.

- Multiple Means of Action and Expression: Once students are engaged with content and have developed an understanding, they should have varied ways to demonstrate their knowledge. This principle supports students in expressing their learning through authentic assessments, tailored to their unique skills and preferences.

The three core principles of Universal Design for Learning (UDL) are supported by overarching themes that emphasize inclusivity and equity in educational practices (CAST, 2024). These themes include:

- Engagement:

    - Recognizing and affirming students' identities, interests, and experiences.
    - Cultivating a sense of belonging within the learning environment.
    - Encouraging joy and play as a shared experience for both educators and students.
    - Using restorative practices to build empathy and address harm in the learning community.

- Representation:

    - Incorporating diverse identities, perspectives, and experiences into the learning content.
    - Acknowledging and respecting cultural and linguistic diversity.
    - Valuing and promoting multiple ways of knowing and interpreting the world.

- Action and Expression:

    - Valuing a variety of communication forms, particularly those that have historically been marginalized.
    - Actively addressing biases to create more inclusive and welcoming spaces.
    - Removing exclusionary practices to foster equitable and accessible learning environments.

These principles and themes guide educators toward creating more inclusive, engaging, and supportive educational experiences for all learners.

By addressing issues of social justice, UDL enables institutions to address structural challenges such as systemic racism, economic inequities, and digital access gaps by promoting an environment that reflects a commitment to equity and diversity. For example, in the university context, UDL can be applied to:

- Foster cultural and linguistic accessibility: Design educational materials and resources that are culturally relevant and sensitive to the needs of international or bilingual students (Torres et al, 2019; Rao et al, 2023b).
- Support first-generation students: Integrate scaffolding to help them navigate the academic and social demands of college (Rose et al., 2021).
- Promote equity in assessments: Offer multiple ways to demonstrate learning, such as projects, presentations, or portfolios, rather than relying exclusively on traditional exams (Tavares et al, 2022).

5. Challenges and Opportunities

One of the challenges and opportunities facing university professors is the attempt to design courses in an inclusive and universal way. Universal design proposals applied to education can be a good starting point to reflect on how this challenge is being addressed in our institutions and to identify the guiding principles that could be used in universities. Based on the observations above, such guidelines could help to improve the quality of education and training pathways.

Faculty are tasked with developing and identifying a syllabus for their courses, with the aim of integrating the basic content of their teaching with that of other courses, in order to highlight the cultural maps/matrices of the educational pathway of the courses. To this end, syllabus development should take place within academic communities of practice, both within a single university and in collaboration between different universities. In this respect, scientific societies that bring together professors of the same discipline from different universities across the country could certainly be helpful. Promoting interdisciplinary meeting places where experts in educational sciences (pedagogy, didactics, educational psychology, sociology of education) and professors from other disciplines have the opportunity to discuss and jointly design curricula and pathways that respond to institutional goals and the needs/potential of students could be a strategy to improve the quality of university teaching. And this is the direction that the establishment of InnovaLabs in each university should take. It is also clear that the time needed to improve the quality of teaching in higher education institutions should be explicitly stated and recognised.

Another challenge is the use of educational technologies that should be integrated into the teaching design, such as analogical mediators. These can be used to promote communication and collaboration, and also to maintain student interest and motivation as

a natural learning support. The risks of educational technologies can include the need for constant updating and sometimes teachers feel ill-equipped to make the right choices. The increasing presence of technological and multimedia support, including AI, can facilitate the development of different curricula and the identification of connections between different sciences

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