



DO-IT

Universal Design in Postsecondary Education: Process, Principles, and Applications

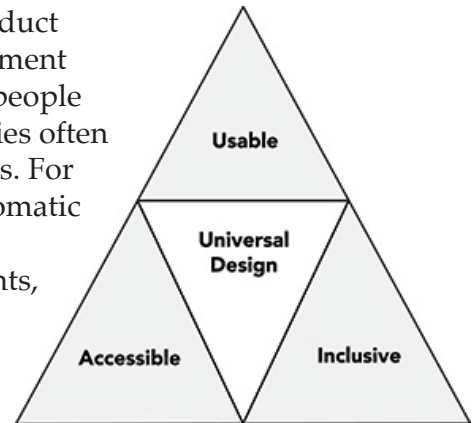
Goal, process, principles, and examples for applying UD to instruction, services, physical spaces, and technology
by Sheryl Burgstahler, Ph.D.

Designing any product or environment involves the consideration of many factors, including aesthetics, engineering options, environmental issues, safety concerns, industry standards, and cost. Typically, designers focus their attention on the average user. In contrast, universal design (UD), according to The Center for Universal Design, “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” (projects.ncsu.edu/ncsu/design/cud/about_ud/about_ud.htm).

When UD principles are applied in a postsecondary institution, educational products and environments meet the needs of potential students with a wide variety of characteristics. Disability is just one of many characteristics that a student might possess. For example, one student could be Hispanic, six feet tall, male, thirty years old, an excellent reader, primarily a visual learner, and deaf. UD requires consideration of all characteristics of potential users, including abilities and disabilities, when developing a course or service.

UD can be applied to any product or environment. For example, a typical service counter in a career services office is not accessible to everyone, including students who are short in stature, use wheelchairs, and cannot stand for extended periods of time. Applying UD principles might result in the design of a counter that has multiple heights—the standard height designed for individuals within the typical range of height and who use the counter while standing up and a shorter height for those who are shorter than average, use a wheelchair for mobility, or prefer to interact with service staff from a seated position.

Making a product or an environment accessible to people with disabilities often benefits others. For example, automatic door openers benefit students, faculty, and staff using walkers and wheelchairs,



but also benefit people carrying books and holding babies, as well as elderly citizens. Sidewalk curb cuts, designed to make sidewalks and streets accessible to those using wheelchairs, are often used by students on skateboards, parents with baby strollers, and delivery staff with carts. When television displays in restaurants, museums, and other public areas are captioned, programming is accessible not only to people who are deaf but also to others who cannot hear the audio in noisy areas.

UD is a goal that puts a high value on both diversity and inclusiveness. It is also a process. The following paragraphs summarize the process, principles, and applications of UD.

The Process of Universal Design

The process of UD requires a macro view of the application being considered as well as a micro view of subparts of the application. The following list suggests a process that can be used to apply UD in a postsecondary setting:

1. *Identify the application.* Specify the product or environment to which you wish to apply universal design.



2. *Define the universe.* Describe the overall population (e.g., users of service), and then describe the diverse characteristics of potential members of the population for which the application is designed (e.g., students, faculty, and staff with diverse characteristics with respect to gender; age; size; ethnicity and race; native language; learning style; and abilities to see, hear, manipulate objects, read, and communicate).
3. *Involve consumers.* Consider and involve people with diverse characteristics (as identified in Step 2) in all phases of the development, implementation, and evaluation of the application. Also gain perspectives through diversity programs, such as the campus disability services office.
4. *Adopt guidelines or standards.* Create or select existing universal design guidelines or standards. Integrate them with other best practices within the field of the specific application.
5. *Apply guidelines or standards.* Apply universal design in concert with best practices within the field (as identified in Step 4) to the overall design of the application, all subcomponents of the application, and all ongoing operations (e.g., procurement processes, staff training) to maximize the benefit of the application to individuals with the wide variety of characteristics identified in Step 2.
6. *Plan for accommodations.* Develop processes to address accommodation requests (e.g., purchase of assistive technology, arrangement for sign language interpreters) from individuals for whom the design of the application does not automatically provide access.
7. *Train and support.* Tailor and deliver ongoing training and support to stakeholders (e.g., instructors, computer support staff, procurement officers, volunteers). Share institutional goals with respect to diversity and inclusion and practices for ensuring welcoming, accessible, and inclusive experiences for everyone.
8. *Evaluate.* Include universal design measures in periodic evaluations of the application; evaluate the application with a diverse group of users, and make modifications based on feedback. Provide ways to collect input from users (e.g., through online and printed instruments and communications with staff).

Universal Design Principles

At The Center for Universal Design (CUD) at North Carolina State University, a group of architects, product designers, engineers, and environmental design researchers established seven principles of UD to provide guidance in the design of products and environments. Following are the CUD principles of UD, each are paired with an example of its application:

1. *Equitable use.* The design is useful and marketable to people with diverse abilities. For example, a website that is designed to be accessible to everyone, including people who are blind, employs this principle.
2. *Flexibility in use.* The design accommodates a wide range of individual preferences and abilities. An example is a museum that allows visitors to choose to read or listen to the description of the contents of a display case.
3. *Simple and intuitive.* Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. Science lab equipment with clear and intuitive control buttons is an example of an application of this principle.



4. *Perceptible information.* The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities. An example of this principle is captioned television programming projected in noisy restaurants.
5. *Tolerance for error.* The design minimizes hazards and the adverse consequences of accidental or unintended actions. An example of a product applying this principle is software applications that provide guidance when the user makes an inappropriate selection.
6. *Low physical effort.* The design can be used efficiently, comfortably, and with a minimum of fatigue. Doors that open automatically for people with a wide variety of physical characteristics demonstrate the application of this principle.
7. *Size and space for approach and use.* Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility. A flexible work area designed for use by employees with a variety of physical characteristics and abilities is an example of applying this principle.

Applications of UD

Listed below are some of DO-IT's resources that you will find in *The Center for Universal Design in Education* at www.uw.edu/doi/CUDE, some with links to videos. Publications may be duplicated for presentations, mailings, and other noncommercial purposes.

Introduction

- *Universal Design: Process, Principles, and Applications*
- *Universal Design in Education: Principles and Applications*

Instruction

- *Equal Access: Universal Design of an Academic Department*
- *Universal Design of Computer Science Departments*
- *Equal Access: Universal Design of Instruction*
- *Universal Design of Instruction: Definition, Principles, and Examples*
- *Equal Access: Universal Design of Distance Learning*
- *20 Tips For Teaching an Accessible Online Course*
- *Real Connections: Making Distance Learning Accessible to Everyone*
- *Universal Design of Web Pages in Class Projects*

Technology

- *Equal Access: Universal Design of Computer Labs*
- *Designing Software that is Accessible to Individuals with Disabilities*
- *Access to Technology in the Workplace: In Our Own Words*
- *Use of Telecommunications Products by People with Disabilities*
- *Creating Video and Multimedia Products that are Accessible to People with Sensory Impairments*
- *Web Accessibility: Guidelines for Administrators*
- *World Wide Access: Accessible Web Design*

Services

- *Equal Access: Universal Design of Student Services*
- *Equal Access: Universal Design of Advising*
- *Equal Access: Universal Design of Career Services*
- *Equal Access: Universal Design of Computer Labs*
- *Equal Access: Universal Design of Financial Aid*
- *Equal Access: Universal Design of Housing and Residential Life*
- *Equal Access: Universal Design of Libraries*
- *Equal Access: Universal Design of Recruitment and Undergraduate Admissions*
- *Equal Access: Universal Design of Registration*



- *Equal Access: Universal Design of Student Organizations*
- *Equal Access: Universal Design of Tutoring and Learning Centers*

Physical Spaces

- *Equal Access: Universal Design of Physical Spaces*
- *Making a Makerspace? Guidelines for Accessibility and Universal Design*
- *Making Science Labs Accessible to Students with Disabilities*
- *Checklist for Making Science Labs Accessible to Students with Disabilities*
- *Facilitating Accessibility Reviews of Informal Science Education Facilities and Programs*
- *Equal Access: Universal Design of Computer Labs*
- *Checklist for Making Computer Labs Accessible to Students with Disabilities*
- *Checklist for Making Engineering Labs Accessible to Students with Disabilities*

Projects, Conference Exhibits, Presentations, and Professional Organizations

- *Equal Access: Universal Design of Conference Exhibits and Presentations*
- *Equal Access: Universal Design of Professional Organizations*
- *Equal Access: Universal Design of Your Project*

Additional Resources

For more information about applications of universal design consult DO-IT Resources (uw.edu/doit/resources) or *The Center for Universal Design in Education* (uw.edu/doit/CUDE).

The following books, found at uw.edu/doit/resources/books, also provide information about applications of UD in higher education:

- Burgstahler, S. (Ed.) (2015). *Universal Design in Higher Education: From Principles to Practice*. Harvard Educational Press.
- Burgstahler, S. (2020). *Creating Inclusive Learning Opportunities in Higher Education: A Universal Design Toolkit*. Harvard Education Press.

About DO-IT

DO-IT (Disabilities, Opportunities, Internetworking, and Technology) serves to increase the successful participation of individuals with disabilities in challenging academic programs and careers such as those in science, engineering, mathematics, and technology. Primary funding for DO-IT is provided by the National Science Foundation, the State of Washington, and the U.S. Department of Education. DO-IT is a collaboration of UW Information Technology and the Colleges of Engineering and Education at the University of Washington.

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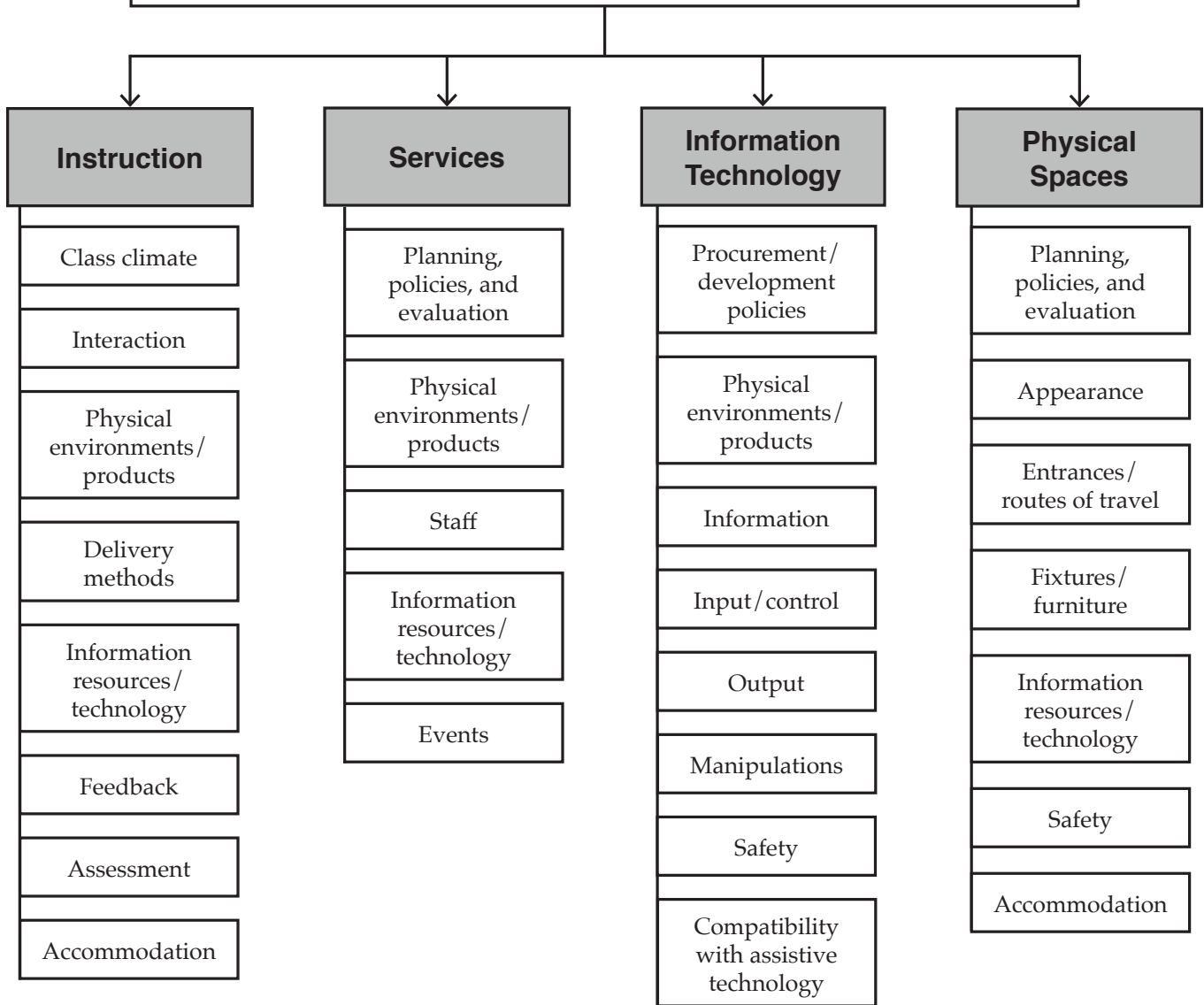
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Applications of Universal Design in Postsecondary Education



Universal design in postsecondary education:

- puts high values on both diversity and inclusion.
- rests on the definition and principles developed at The Center for Universal Design, www.ncsu.edu/project/design-projects/udi/.
- strives to make products and environments welcoming, accessible, and usable for everyone.
- is a process as well as a set of guidelines and strategies for specific applications.
- can be applied to instruction, services, information, technology, and physical spaces.
- can be implemented in incremental steps.

Examples of Universal Design in Postsecondary Education

In Instruction

- A statement on a syllabus that invites students to meet with the instructor to discuss learning needs.
- Multiple delivery methods that motivate and engage all learners.
- Flexible curriculum that is accessible to all learners.
- Examples that appeal to students with a variety of characteristics with respect to race, ethnicity, gender, age, and interest.
- Regular, accessible, and effective interactions between students and the instructor.
- Allowing students to turn in parts of a large project for feedback before the final project is due.
- Class outlines and notes that are on an accessible website.
- Assessing student learning using multiple methods.
- Faculty awareness of processes and resources for disability-related accommodations.

In Services

- Service counters that are at a height accessible from both a seated and standing position.
- Staff that are aware of resources and procedures for providing disability-related accommodations.
- Pictures in publications and on websites that include people with diverse characteristics with respect to race, age, gender, and disability.
- A statement in publications about how to request special assistance, such as a disability-related accommodation.
- A student service website that adheres to accessibility standards (see www.section508.gov/ for those of the federal government).
- Printed materials that are easy to reach from a variety of heights and without furniture blocking access.
- Printed publications that are available in alternate formats (e.g., electronic, large print, Braille).

In Information Technology

- Captioned videos.
- Alternative text for graphic images on web pages so that individuals who are blind and using text-to-speech technology can access the content.
- Procurement policies and procedures that promote the purchase of accessible products.
- Adherence to standards for the accessible and usable design of websites.
- Comfortable access to computers for both left- and right-handed students.
- Software that is compatible with assistive technology.
- Computers that are on adjustable-height tables.

In Physical Spaces

- Clear directional signs that have large, high-contrast print.
- Restrooms, classrooms, and other facilities that are physically accessible to individuals who use wheelchairs or walkers.
- Furniture and fixtures in classrooms that are adjustable in height and allow arrangements for different learning activities and student groupings.
- Emergency instructions that are clear and visible and address the needs of individuals with sensory and mobility impairments.
- Non-slip walking surfaces.