



# Universal Design of Instruction: Definition, Principles, and Examples

**DO-IT**

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Precollege and college students come from a wide variety of ethnic and racial backgrounds. For some, English is not their first language. Represented in most classes are many types of racial/ethnic backgrounds, ages, native languages, and learning styles, including visual and auditory learners. In addition, increasing numbers of students with disabilities are included in regular precollege and postsecondary courses. Their disabilities include blindness, low vision, hearing impairments, mobility impairments, learning disabilities, and health impairments.

Students are in school to learn and instructors share this goal. How can educators design instruction to maximize the learning of all students? The field of universal design can provide a starting point for developing a framework for instruction. You can apply this body of knowledge to create courses where lectures, discussions, visual aids, videos, printed materials, labs, and fieldwork are accessible to all students.

## Universal Design

Designing any product or environment involves the consideration of many factors, including aesthetics, engineering options, environmental issues, industry standards, safety concerns, and cost. Typically, products and environments are designed for the average user. In contrast, universal design (UD) 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” ([http://www.design.ncsu.edu/cud/about\\_ud/about\\_ud.htm](http://www.design.ncsu.edu/cud/about_ud/about_ud.htm)). For example, a standard door is not accessible to everyone. If a large switch is installed, the door becomes accessible to more people, including some wheelchair users. However, applying universal design principles could lead to the installation of sensors that signal the door to open when anyone approaches, making the

building accessible to everyone—a small child, a man carrying a large box, an elderly woman, a person using a walker or wheelchair.

When designers apply universal design principles, their products and environments meet the needs of potential users with a wide variety of characteristics. Disability is just one of many characteristics that an individual might possess. For example, one person could be five feet four inches tall, female, forty years old, a poor reader, and deaf. All of these characteristics, including her deafness, should be considered when developing a product or environment she and others might use.

Making a product or environment accessible to people with disabilities often benefits others. For example, sidewalk curb cuts, designed to make sidewalks and streets accessible to those using wheelchairs, are today often used by kids on skateboards, parents with baby strollers, and delivery staff with rolling carts. When television displays in noisy areas of airports and restaurants are captioned, they are more accessible to people who are deaf and everyone else.

## Universal Design of Instruction

At the Center for Universal Design at North Carolina State University a group of architects, product designers, engineers, and environmental design researchers established seven principles of universal design to provide guidance in the design of products and environments (Connell, Jones, Mace, Mueller, Mullick, Ostroff, Sanford, Steinfeld, Story, & Vanderheiden, 1997). The principles of universal design are listed below along with an example of the universal design of instruction (UDI) for each.

1. **Equitable Use.** The design is useful and marketable to people with diverse abilities. *For example, a professor’s website that is designed so that it is accessible to everyone, including students who are blind and using text-to-speech software, employs this principle.*



2. **Flexibility in Use.** The design accommodates a wide range of individual preferences and abilities. *An example is a museum, visited as a field trip for a course, that allows a visitor 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 control buttons that are clear and intuitive 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 being employed is when multimedia projected in a course includes captions.*
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 educational software that provides guidance and background information when the student makes an inappropriate selection.*
6. **Low Physical Effort.** The design can be used efficiently and comfortably, and with a minimum of fatigue. *Doors to a lecture hall 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 science lab work area designed for use by students who are left- or right-handed and with diverse physical characteristics and abilities is an example of employing this principle.*

Universal design principles can be applied to many products and environments. Using the Center for Universal Design format, universal design of instruction can be defined as the design of instruction to be usable by all students, without the need for adaptation or specialized

design. The Council for Exceptional Children elaborates as follows:

In terms of learning, universal design means the design of instructional materials and activities that makes the learning goals achievable by individuals with wide differences in their abilities to see, hear, speak, move, read, write, understand English, attend, organize, engage, and remember. Universal design for learning is achieved by means of flexible curricular materials and activities that provide alternatives for students with differing abilities. These alternatives are built into the instructional design and operating systems of educational materials—they are not added on after-the-fact.

Universal design principles can be applied to the overall design of instruction as well as to specific instructional materials, facilities, and strategies such as lectures, classroom discussions, group work, Web-based instruction, labs, field work, and demonstrations. Universally designed curriculum provides students with a wide range of abilities, disabilities, ethnic backgrounds, language skills, and learning styles multiple means of representation, expression, and engagement (<http://www.cast.org/>). Listed below are examples of instruction that employ principles of universal design. They are organized under seven performance indicator categories, with a goal statement for each.

1. **Class Climate.** *Adopt practices that reflect high values with respect to both diversity and inclusiveness.* Example: Put a statement on your syllabus inviting students to meet with you to discuss disability-related accommodations and other special learning needs.
2. **Physical Access, Usability, and Safety.** *Assure that activities, materials, and equipment are physically accessible to and usable by all students and that all potential student characteristics are addressed in safety considerations.* Examples: Develop safety procedures for all students, including those who are blind, deaf, or wheelchair users; label safety equipment simply, in large print, and in a location viewable from a variety of angles; repeat printed directions orally.



3. **Delivery Methods.** *Use multiple accessible instructional methods.* Example: Use multiple modes to deliver content and motivate and engage students—consider lectures, collaborative learning options, hands-on activities, Internet-based communications, educational software, field work, etc.
4. **Information Resources.** *Assure that course materials, notes, and other information resources are flexible and accessible to all students.* Example: Choose printed materials and prepare a syllabus early to allow students the option of beginning to read materials and work on assignments before the class begins and to allow adequate time to arrange for alternate formats, such as books on tape.
5. **Interaction.** *Encourage effective interactions between students and the instructor and assure that communication methods are accessible to all participants.* Example: Assign group work for which learners must support each other and that places a high value on different skills and roles.
6. **Feedback.** *Provide specific feedback on a regular basis.* Example: Allow students to turn in parts of large projects for feedback before the final project is due.
7. **Assessment.** *Regularly assess student progress using multiple, accessible methods and tools and adjust instruction accordingly.* Example: Assess group/cooperative performance as well as individual achievement.
8. **Accommodation.** *Plan for accommodations for students for whom the instructional design does not meet their needs.* Example: Know how to get materials in alternate formats, reschedule classroom locations, and arrange for other accommodations for students with disabilities.

*Note that employing universal design principles in instruction does not eliminate the need for specific accommodations for students with disabilities.*

For example, you may need to provide a sign language interpreter for a student who is deaf. However, applying universal design concepts in course planning assures full access to the content for most students and minimizes the

need for special accommodations. For example, designing Web resources in accessible formats as they are developed means that no redevelopment is necessary if a blind student enrolls in the class.

Accessible design benefits students with disabilities but also benefits others. For example, captioning course videos, which provides access to deaf students, is also a benefit to students for whom English is a second language, to some students with learning disabilities, and to those watching the tape in a noisy environment. Delivering content in redundant ways can improve instruction for students with a variety of learning styles and cultural backgrounds. Letting all students have access to your class notes and assignments on a Web site benefits students with disabilities and everyone else. Planning ahead saves time in the long run.

Employing universal design principles in everything we do makes a more accessible world for all of us. It minimizes the need to alter it for anyone. For a checklist for the application of UDI consult *Equal Access: Universal Design of Instruction* at [http://www.washington.edu/doit/Brochures/Academics/equal\\_access\\_udi.html](http://www.washington.edu/doit/Brochures/Academics/equal_access_udi.html).

## Resources

Consult the following resources for further information on universal design of instruction.

### Applications of Universal Design

<http://www.washington.edu/doit/Resources/udesign.html>

Bar, L., & Galluzzo, J. (1999). *The accessible school: Universal design for educational settings*. Berkeley, CA: MIG Communications.

Burgstahler, S. (2006). *Equal access: Universal design of instruction*. Seattle: DO-IT, University of Washington.

[http://www.washington.edu/doit/Brochures/Academics/equal\\_access\\_udi.html](http://www.washington.edu/doit/Brochures/Academics/equal_access_udi.html)

Center for Applied Special Technology (CAST)  
<http://www.cast.org/udl/>



The Center for Universal Design  
<http://www.design.ncsu.edu/cud/>

Council for Exceptional Children  
<http://www.cec.sped.org/osep/udesign.html>

Edyburn, D., & Higgins, K. (Eds.). (2005). *Handbook of special education technology research and practice*. Whitefish Bay, WI: Knowledge by Design.

National Center for Accessible Media (NCAM)  
<http://main.wgbh.org/wgbh/pages/ncam/>

Orkwis, R., & McLane, K. (1998). *A curriculum every student can use: Design principles for student access*.  
<http://www.cec.sped.org/osep/udesign.html>

Pisha, B., & Coyne, P. (2001). Smart from the start: The promise of universal design for learning. *Remedial and Special Education*, 22(4), 197-203.

Pliner, S., & Johnson, J. (2004). Historical, theoretical, and foundational principles of universal design in higher education. *Equity of Excellence in Education*, 37, 105-113.

Scott, S., McGuire, J., & Shaw, S. (2003). Universal design for instruction: A new paradigm for adult instruction in postsecondary education. *Remedial and Special Education*, 24(6), 369-379.

Silver, P., Bourke, A., & Strehorn, K. C. (1998). Universal instructional design in higher education: An approach for inclusion. *Equity & Excellence in Education*, 31(2), 47-51.

## About DO-IT

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