

Universal Design of Instruction

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Students in academic classes come from a wide variety of ethnic and racial backgrounds. For some, English is not their first language. In most classes, there are students with many types of learning styles, including those who are primarily visual or auditory learners. In addition, increasing numbers of students with disabilities are pursuing postsecondary education. Their disabilities include:

- blindness,
- low vision,
- hearing impairments,
- mobility impairments,
- learning disabilities,
- health impairments, and
- psychiatric health impairments.

Students want to learn and their instructors share this goal. How can instructors select their curriculum and instructional strategies to maximize the learning of all students? The field of universal design can provide a starting point for developing an appropriate teaching model. This body of knowledge can guide instructors in creating courses where lectures, discussions, visual aids, videos, printed materials, Web resources and field work are accessible to all students.

Universal Design

Designing any product or environment involves the consideration of many factors including aesthetics, engineering options, environmental issues, safety concerns, and cost. Often the design is created for the "average" user. In contrast [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." Universal design is an approach to the designed products and environments, including instruction, that takes into consideration the the variety of abilities, disabilities, racial/ethnic backgrounds, reading abilities, ages, and other characteristics of the student body.

Rather than focus on adapting things for an individual at a later time, an accessible universally designed learning environments are created to be accessible to everyone from the beginning. When designers apply universal design principles, their products and services 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 service, including instruction, she might use.

Making a product or service 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 more often used by kids on skateboards, parents with baby strollers, and delivery staff with rolling carts. When television displays in airports and restaurants were

captioned, they would benefit people who cannot hear the audio because of a noisy environment as well as those who are deaf.

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 environments and products. Following are the principles of universal design along with an example in academic programs for each.

1. **Equitable Use.** The design is useful and marketable to people with diverse abilities. For example, a 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 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 a good 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 noisy academic conference exhibit includes captioning.
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 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 that are easy to open by 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 science lab work area designed for use by students with a wide variety of physical characteristics and abilities is an example of employing this principle.

Universal design principles can be applied to any product or environment. Following is a definition of universal design in education developed by the Council for Exceptional Children.

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. (*Research Connections*, Number 5, Fall 1999, p. 2)

When designing classroom instruction or a distance learning class, strive to create a learning environment that allows all students, including a person who happens to have a characteristic that is termed "disability," to access the content of the course and fully participate in class activities. Universal design principles can apply to lectures, classroom discussions, group work, handouts, Web-based instruction, fieldwork, and other academic activities.

Below are examples of instructional methods that employ principles of universal design. Applying these strategies can make your course content accessible to people with a wide range of abilities and disabilities, ethnic backgrounds, language skills, and learning styles.

1. **Inclusiveness.** Create a classroom environment that respects and values diversity. Put a statement on your syllabus inviting students to meet with you to discuss disability-related accommodations and other special learning needs. Avoid segregating or stigmatizing any student. Respect the privacy of all students.
2. **Physical Access.** Assure that classrooms, labs, and field work are accessible to individuals with a wide range of physical abilities and disabilities. Make sure equipment and activities minimize sustained physical effort, provide options for operation, and accommodate right- and left-handed students and those with limited physical abilities. Assure the safety of all students.
3. **Delivery Methods.** Use multiple modes to deliver content. Alternate delivery methods, including lecture, discussion, hands-on activities, Internet-based interaction, and fieldwork. Make sure each is accessible to students with a wide range of abilities, disabilities, interests, and previous experiences. Face the class and speak clearly. Provide printed materials that summarize content delivered orally. Provide printed materials early to allow the student to prepare ahead of time.
4. **Web Pages.** Provide printed materials in electronic format. Create printed and Web-based materials in simple, intuitive, and consistent formats. Provide text descriptions of graphics presented on Web pages. Arrange content in order of importance.
5. **Interaction.** Encourage different ways for students to interact with each other and with you. These methods may include in-class questions and discussion, group work, and Internet-based communications.
6. **Feedback.** Provide effective prompting during an activity and feedback after the assignment is complete.
7. **Provide multiple ways for students to demonstrate knowledge.** For example, besides traditional tests and papers, consider group work, demonstrations, portfolios, and presentations as options for demonstrating knowledge.

Employing universal design principles in instruction does not eliminate the need for specific accommodations for students with disabilities. There will always be the need for some specific accommodations, such as sign language interpreters for students who are deaf. However, applying universal design concepts in course planning will assure full access to the content for most students and minimize the need for specific accommodations. For example, designing Web resources in accessible format as they are developed means that no re-development is necessary if a blind student enrolls in the class; planning ahead can be less time-consuming in the long run. Letting all students have access to your class notes and assignments on an accessible Web site can eliminate the need for providing materials in alternative formats.

Check Your Understanding

Employing universal design principles to fully include one group of students can generate unanticipated benefits to others. Select from the list below those students who might benefit from captioning on your course videotapes.

1. [Students for whom English is a second language.](#)
2. [Students who are deaf.](#)
3. [Students with visual impairments.](#)
4. [Students watching the videotape in a noisy environment.](#)
5. [Students who have learning disabilities.](#)

Specific Academic Applications

Employing universal design principles in everything we do makes a user-friendly world for all of us. It creates an accessible environment, minimizing the need to alter it for individuals with special needs.

Universal design strategies can be employed when engaging in specific academic activities. Access the following sections of The Faculty Room to learn more about applying universal design to:

[Large lectures.](#)

[Group/work discussions.](#)

[Test taking.](#)

[Field work.](#)

[Science labs.](#)

[Computer labs.](#)

[Computers.](#)

[World Wide Web pages.](#)

[Distance learning.](#)

[Art work.](#)

[Writing assignments.](#)

[Travel programs.](#)

[Work-based learning.](#)

The Process of Universal Design

Principles of universal design can be employed to the development and delivery of any course. To apply this model the instructor to select appropriate strategies for the delivery of instruction and then to apply universal design to specific activities in a classroom. Specifically, the instructor needs to:

1. Select the course, goals, overall content to which they wish to apply universal design.
2. Define the "universe," the group of students who are qualified to enroll in the course. Identify the potential diversity within the group with respect to gender; age; size;

ethnicity/race; native language; learning styles; and abilities to see, hear, move and manipulate objects, and learn.

3. Apply universal design as well as preferred standards for good practice (e.g., Chickering & Gamson) to the overall design of instruction (e.g., choose lecture, discussion, cases, online notes, and models for delivering a specific topic to maximize the learning of students with the wide variety of characteristics identified in step 2).
4. Apply universal design to specific instructional methods and curriculum materials (e.g., assure that the course website meets accessibility guidelines).
5. Develop processes to address the accommodation needs of specific students with disabilities for whom the course design does not automatically provide access (e.g., refer students who need sign language interpreters to the disabled student services office).
6. On an ongoing basis, monitor effectiveness of the instruction by gathering feedback from student participation and learning and make modifications based on this feedback. Also include universal design issues in the course evaluation and make course modifications based on this feedback.

Consult the following sections of The Faculty Room to learn about access challenges and solutions for students with specific types of disabilities:

[Blindness](#)

[Hearing impairments](#)

[Low vision](#)

[Learning disabilities](#)

[Mobility impairments](#)

[Health impairments](#)

[Psychiatric/mental health impairments](#)

Questions and answers, case studies, and promising practices can be found in the searchable [Faculty Room Knowledge Base](#).