

# UNIVERSAL DESIGN: A TEACHING STRATEGY FOR DESIGN STUDENTS

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## Abstract

*This paper presents a teaching strategy intended to help students to better understand the nature and consequences of disabling conditions and to apply the concepts to the design of universal environments. Objectives and learning strategies for gaining the objectives are presented.*

## Introduction

Universal design is characterized by design features that promote access to and utilization of environments by people with all degrees of physical or mental ability. It reflects the concept that what is functional and available for one population should be so for all people. It is important to recognize that most people have disabilities (either temporarily or permanently) within their lifetimes. Disabilities cut across all classes and races. Anyone can become disabled. As Caplan (1992) states, "if more than 43 million of us are physically disabled, and our buildings and cities (and housing) tell us that no one is, then our cities are architectural euphemisms, distorting reality to express an image of something more acceptable" (p. 90). The role of universal design, then, is to return our buildings to a recognition of reality.

Given the potential role of interior designers and architects in the implementation of the Americans with Disabilities Act (ADA) and the creation of universal design, and their past failure to understand completely and address successfully the needs of the population for which they designed, it is important that educational programs foster students' understanding of, and sensitivity to, the needs of individuals with disabilities.

## Purpose

This paper presents a teaching strategy intended to help students gain a working knowledge of disablements and to develop sensitivity to the environmental needs of

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individuals with disabilities. The primary objective of such a strategy is that students will be better able to understand the nature and consequences of disabling conditions and to apply the concepts to the design of truly universal environments. It is critically important that students understand the functional implications of disabilities, for these occur in the same way no matter what environment a person experiences.

### **Teaching Strategy**

The teaching strategy employed in the unit is presented as follows. The concepts delineated build upon each other in such a way that the result is a thorough understanding of the limitations created by disabilities and the importance of universal design. While the learning activities may be modified to accommodate time constraints and special needs of the class, the authors believe that the inclusion of all the concepts outlined is critical.

### **Universal Design Teaching Strategy**

#### **I. Concept: History related to the ADA**

**Objective: Students will be able to describe the history of public policy related to the ADA.**

**Learning Strategies:**

- Students review the ADA from inception to passage. In addition to typical library resources, students are encouraged to review Congressional records and interview building owners, rehabilitation specialists, and others who have an understanding of the act and its implications. Concepts to be addressed should include, but are not limited to: civil rights, integration, independence, choice, equality, dignity, and accessibility.
- Students present a graphic time line illustrating policy development and the philosophical and legal issues involved. This assignment allows students who are typically visually oriented to translate detailed information into a graphic format they can more easily understand.

#### **II. Concept: Definition of what constitutes a functional limitation**

**Objective: Students will be able to define and discuss what constitutes a functional limitation.**

**Learning Strategies:**

- Students conduct an interview(s) with someone who has a disability (e.g. visual impairment, mobility impairment, hearing impairment). In this segment, it is important to help students realize this disability may be permanent (as with a paraplegic) or temporary (as with someone who has broken a leg skiing).

- Class presentations from professionals who deal with universal design issues are also a part of this segment. Presentations need to represent a variety of viewpoints. Possible areas of expertise include sports medicine, gerontology, law, and community development.

### **III. Concept: Internalization of functional limitation**

**Objective: Students will be able to gain a realistic understanding of the challenges faced by individuals with functional limitations.**

**Learning strategies:**

- Students are assigned a functional limitation and “outfitted” with equipment used to simulate the disability (e.g., blindfold, gloves, etc.), as well as standard mobility equipment that might be used by a person with a specific limitation (e.g. wheelchair, crutches, cane, etc.).
- Once students have been assigned and equipped for a specific limitation(s), they are assigned various campus and community environments to experience and evaluate. These environments should include campus buildings, housing, public buildings, retail stores, and public transportation and/or parking facilities.
- The attached Functional Limitation Worksheet (Figure 1) is then used as a guide for analyzing problems/challenges faced by someone with a specific limitation(s) and to generate possible solutions and alternatives. A group discussion is recommended.
- While the purpose of this activity is to help students understand the challenges related to design, it often leads to a discussion of attitudes toward people with functional limitations. An optional activity might be to include a rehabilitation specialist as a resource person. This individual can help students process the feelings and attitudes they experienced during their environmental study activity.

### **IV. Concept: Factors contributing to universal design**

**Objective: Students will be able to synthesize the principles that contribute to universal design.**

**Learning Strategies:**

- During this concept attainment exercise, students generate examples/non examples of universal design, through the analysis and evaluation of plans and design features (i.e., knobs vs. levers) supplied by the instructor(s).

Functional Limitation \_\_\_\_\_

Possible Causes:

- 1.
- 2.
- 3.
- 4.
- 5.

Usual Life & Work Activities	Problems/ Challenges*	Solutions/Alternatives**
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

\* How can a person with functional limitation do or not do task?

\*\*What can the individual do differently? How does the design contribute, or hinder, the solution?

**ADA legal & philosophical concepts:** civil rights, integration, independence, choice, facts, equal, effective, dignity, fair, readily accessible, aesthetically pleasing, de-medicalized.

How do these concepts affect the challenge posed by the functional limitations or solutions?

*learning activity format designed by V.K. Wrightt*

Figure 1. Functional Limitation Worksheet

- Students then compile a file or notebook of examples and “non examples” on their own. The file also should include a list/table of dimensional requirements necessary to achieve accessibility.

**V. Concept: Application of universal design**

**Objective: Students will be able to apply concepts of universal design to an actual design situation.**

**Learning Strategies:**

- Students are given a small sketch problem that must be solved using the information gained. (e.g., the design of a building entry and immediate surroundings).
- Students are then given a larger design problem. If possible, a team approach can be used with this problem (e.g., one interior design student teamed with an architecture student). If the class size is large enough, or there are multiple sections of a course, it might be beneficial for one group to focus on a design problem for the elderly and one group to focus on a design problem for children.  
Students are required to give a presentation of their findings. Individuals who served as resource people in Segment II may be involved in the critique of the projects, in order to give students further opportunity for a realistic evaluation of their work.
- It is important that the larger design problem be structured to address not only accessibility but surfaces, furnishings, lighting, signage, and color as well, in order to fully comprehend the concepts underlying universal design.
- Figure 2, Examples of student generated solutions, illustrates the notations used to support the graphic designs presented by the students. The notations (or bullets) are a way of calling to the attention of the client that the fundamental concepts related to universal design have been met.

## **Evaluation**

The initial segments of the teaching strategy described above were used with upper level students in interior design and architecture at the University of Nebraska-Lincoln. Because the purpose of the teaching strategy was to help students gain a working knowledge of disablements and to develop sensitivity to the needs of those with disabilities, baseline data measuring student attitudes in this area were collected prior to teaching this unit. After the first four segments of the teaching strategy, and prior to Segment V application, the instrument was re-administered.

#### UNIVERSAL DESIGN MATERIALS

- short carpet pile for wheelchair access
- ergonomic seating
- contrasting material colors and values for easy identification

#### UNIVERSAL DESIGN LIGHTING/ACOUSTICS

- acoustical ceiling tiles to decrease excess sound transmission
- diffused lighting to reduce glare
- flashing lights to cue telephone ring, exit sign, or computer

#### UNIVERSAL DESIGN WAYFINDING/COMMUNICATION

- raised letters on office doors
- contrasting molding at doorways
- curved walls for safe wayfinding
- teletype phones and phones with amplifiers

#### UNIVERSAL DESIGN FURNISHINGS

- adjustable worksurfaces and storage heights
- seating arrangement to facilitate lipreading
- reception desk with work surfaces at varied heights

*student work by Cynthia Delzell*

Figure 2. Examples of Student Generated Design Solutions.

The two-part instrument was intended to measure an individual's attitude toward persons with disabilities. The first part of the instrument assessed the students' previous contact with persons with disabilities. In the second part of the instrument, students were asked to respond to such statements as: "Physically disabled persons are just as intelligent as non disabled ones"; and "It is almost impossible for a disabled person to lead a normal life." Respondents indicated the degree to which they agreed or disagreed with each statement on a six-point Likert-type scale. "The results show that the educational unit appears to have had a positive affect on students. Though not statistically significant, in most cases, the attitudes of the students toward individuals with disabilities improved following the educational unit." (Gabb & Lodl, 1994, p. 45).

Based upon the results of the assessment, the teaching strategy presented appears to have positively influenced the understanding of both groups of students (architecture and interior design) concerning their perceptions of individuals with disabilities. While it was not possible to evaluate students' attitudes following the application segment of the unit, it would be beneficial to reassess students' attitudes after they have completed a design project. Likewise, it would be desirable to assess individuals' attitudes after they have had experience with universal design as practicing professionals.

Discrimination can come with non-supportive design solutions that lack an awareness of individuals with disabilities, yet still meet the "letter of the law." With the use of this teaching strategy, "the students were better able to see past a disability to the person within and to perceive the potential for individuals with disabilities to lead a full and active life" (Gabb & Lodl, 1994, p. 45). As design educators, it should be our goal to work toward the day, as William Tangye (former Chairman of the Access Board) describes, "when buildings are accessible not by special requirement or provision but rather, because it is simply the way they are envisioned, designed, and built" (1993, p. 14). It is only then that universal design will truly become reality

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