

## The Principles of Universal Design\*

*\*Re-printed with Permission: Copyright 1997 NC State University, The Center for Universal Design*

**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 Principles of Universal Design are presented here, in the following format: name of the principle, intended to be a concise and easily remembered statement of the key concept embodied in the principle; definition of the principle, a brief description of the principle's primary directive for design; and guidelines, a list of the key elements that should be present in a design which adheres to the principle. (Note: all guidelines may not be relevant to all designs.)

### **Principle One: Equitable Use**

The design is useful and marketable to people with diverse abilities.

#### **Guidelines:**

- 1a.** Provide the same means of use for all users: identical whenever possible; equivalent when not.
- 1b.** Avoid segregating or stigmatizing any users.
- 1c.** Provisions for privacy, security, and safety should be equally available to all users.
- 1d.** Make the design appealing to all users.

### **Principle Two: Flexibility in Use**

The design accommodates a wide range of individual preferences and abilities.

#### **Guidelines:**

- 2a.** Provide choice in methods of use.
- 2b.** Accommodate right- or left-handed access and use.
- 2c.** Facilitate the user's accuracy and precision.
- 2d.** Provide adaptability to the user's pace.

### **Principle Three: Simple and Intuitive Use**

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

**Guidelines:**

- 3a.** Eliminate unnecessary complexity.
- 3b.** Be consistent with user expectations and intuition.
- 3c.** Accommodate a wide range of literacy and language skills.
- 3d.** Arrange information consistent with its importance.
- 3e.** Provide effective prompting and feedback during and after task completion.

**Principle Four: Perceptible Information**

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

**Guidelines:**

- 4a.** Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- 4b.** Provide adequate contrast between essential information and its surroundings.
- 4c.** Maximize "legibility" of essential information.
- 4d.** Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- 4e.** Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

**Principle Five: Tolerance for Error**

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

**Guidelines:**

- 5a.** Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- 5b.** Provide warnings of hazards and errors.
- 5c.** Provide fail safe features.
- 5d.** Discourage unconscious action in tasks that require vigilance.

**Principle Six: Low Physical Effort**

The design can be used efficiently and comfortably and with a minimum of fatigue.

**Guidelines:**

- 6a.** Allow user to maintain a neutral body position.
- 6b.** Use reasonable operating forces.
- 6c.** Minimize repetitive actions.
- 6d.** Minimize sustained physical effort.

**Principle Seven: 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.

**Guidelines:**

- 7a.** Provide a clear line of sight to important elements for any seated or standing user.
- 7b.** Make reach to all components comfortable for any seated or standing user.
- 7c.** Accommodate variations in hand and grip size.
- 7d.** Provide adequate space for the use of assistive devices or personal assistance.

Please note that the Principles of Universal Design address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations such as economic, engineering, cultural, gender, and environmental concerns in their design processes. These Principles offer designers guidance to better integrate features that meet the needs of as many users as possible.

Compiled by advocates of universal design, listed in alphabetical order:

Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg Vanderheiden

The authors, a working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.