Universal Design

Diversity and Design

Applications to your project
Universal Design

- The design of all products and environments to be usable by all people to the greatest extent possible without the need for adaptation or specialized design (*Mace, 1990*)
  - Supports all types and levels of ability
  - Implies that environmental demands on all abilities will be minimized
Accessible Design: Reduce environmental demands on individuals with disability through specialized design

Universal Design: Reduce environmental demands on individuals with all levels of ability through better design overall
Principles of Universal Design

- 1. Equitable Use
- 2. Flexibility in Use
- 3. Simple and Intuitive Use
- 4. Perceptible Information
- 5. Tolerance for Error
- 6. Low Physical Effort
- 7. Size and Space for Approach and Use

“Accepted” Principles of UD -- Center for Universal Design NCSU, 1997 Principles of Universal Design
Will You Use Principles of UD?

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Do you have a “special” population?
Does it matter?
How can you find out about exceptions?
How can you make your design universal?
1. Equitable Use

- Used in same/equivalent manner
  - Avoids segregating any users
2. Flexibility in Use

- Provides choice in methods of use
- Permits right- or left- handed use
- Requires min accuracy & precision
- Adaptable to user’s pace
3. Simple and Intuitive Use

- Eliminate complexity
- Consistent with expectations
- Accommodate range of literacy/language
- Arrange information consistent with importance
- Prompting and feedback during task and after

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4. Perceptible Information

- Is multi-modal for redundant information
- Maximizes legibility of essential information
- Differentiates elements
5. Tolerance for Error

- Arranges elements to minimize hazards and errors
- Provides warnings of hazards/errors
- Provides fail safe features
- Discourages unconscious actions
6. Low Physical Effort

- Is used in neutral body position
- Has reasonable operating forces
- Minimizes repetitive actions
- Minimizes sustained effort
7. Size & Space for Approach & Use

- Provides clear line of sight to important elements
- Has reachable components
- Accommodates variations in grip
- Has adequate space for AT or caregiver
Learn About (Dis)abilities

- What are your users capable of?
- Vision loss
- Hearing loss
- Mobility impairment
- Tactile sensory loss
- Cognitive/memory impairment
- Affect management
- Etc.
What Can You Do?

- **How can you apply UD principles to your design process?** Applying UD principles means:
  - Consider more than just the problem facing you.
  - Learn about the different abilities people have.
  - Strive to make your designs inclusive.
  - Take time to make the product aesthetically appealing.
Upcoming

- Needs & Task Analysis
- Requirements Definition
- Evaluation *without* users
  - Predictive evaluation
    - Heuristic evaluation...
  - Interpretive evaluation
    - Ethnography...
- User modeling
Usability Concept of the Day

- Continuous vs. Discrete data -- match display to content type
  - Does data “flow” or is it displayed in “chunks”?
  - (the interface needs to reflect the appropriate interaction style)