Universal Design for Learning

Benefits for All When Designing for All

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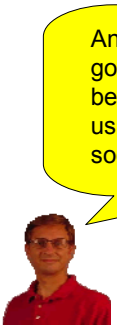
Lloyd P. Rieber

- Professor
  - My 18th year at UGA
  - Six years at TAMU
- Degrees
  - B.S. University of Pittsburgh
  - M.A. University of New Mexico
  - Ph.D. Penn State
- Teaching
  - Interactive Multimedia (Studio)
  - K-12 Technology Integration
  - Instructional Design
  - Research Methods
  - Universal Design
- Areas of Research
  - Visualization
  - Experiential Learning (Play Theory)
  - Microworlds, Simulations, & Games
  - Game design as learning
  - Use of assistive technology with special populations

Goals

- Overview and brief history of Universal Design for Learning
- Examples and implications of principles
- Persuade you to use UDL as a new lens for understanding your own work
- Motivate you to want to learn more
- iSkills Project: New $1.2 million federal project

Universal Design for Learning



Universal Design for Learning and Instruction: More than ALT Tags

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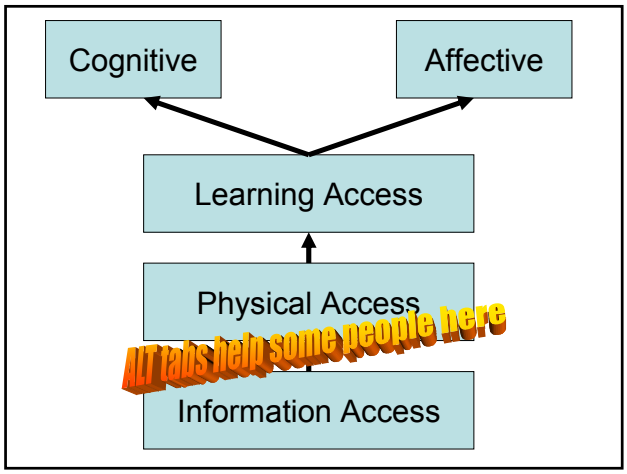
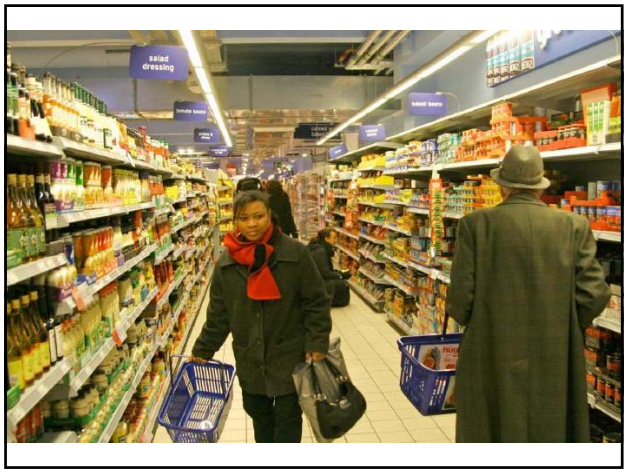
But, adding ALT tags is a good start



Reasons to Practice Universal Design

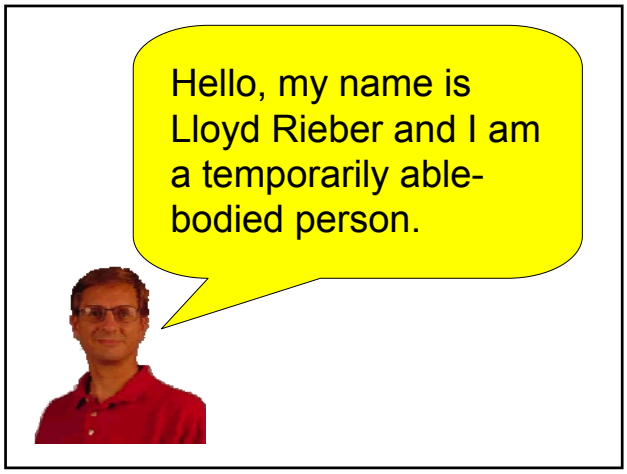
- It's the right thing to do.
- It's the ultimate in working "smarter, not harder."
- If practiced by all, it may help YOU in the end. (You have, or will have, needs that it addresses.)
- It's required in most federally funded projects (e.g. eLearning).

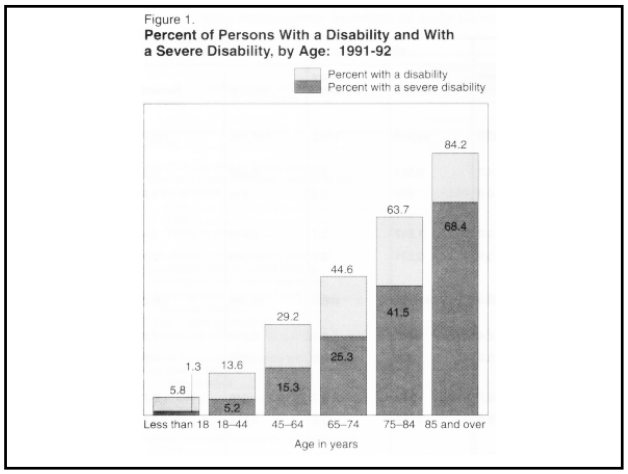


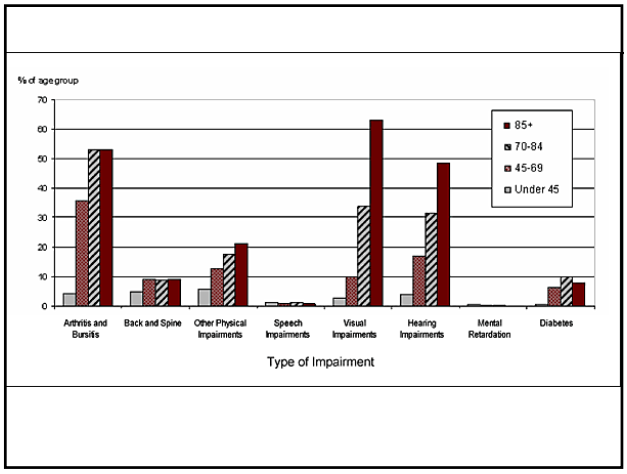
Aging statistics

- "One American in five has a disability, making people with disabilities the largest minority group and the only group that anyone can join at any time: at birth or through an accident, illness, or the aging process."

http://www.disabilityisnatural.com/







People First Language: Because Words Matter

- Avoid…

  -a deaf man
  -a blind person
  -a woman confined to a wheel chair
  -a girl suffering from multiple sclerosis

- Use instead…

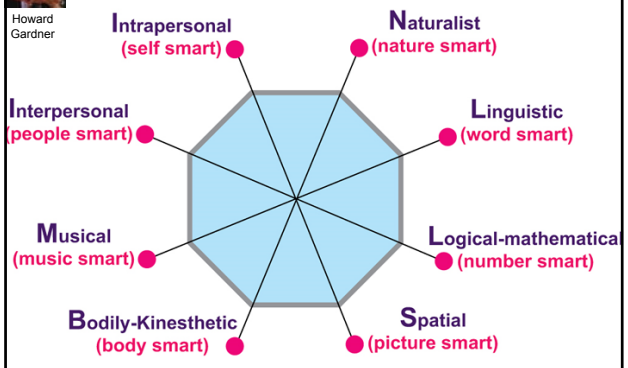
  -a man who is deaf
  -a person who is blind
  -a woman using a wheel chair
  -a girl with multiple sclerosis

Actually, we all have our strengths and weaknesses…

What are you good at?
What are you not very good at?

Howard Gardner

8 Multiple Intelligences



Origins of Universal Design

Universal Design (UD)

- Coined by Dr. Ron Mace, Professor of Architecture of NCSU
- "Design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (Ron Mace, Center for Universal Design, North Caroline State University)

Mace, R.L., Hardie, G. J., Place, J. P. (1991). Accessible Environment: Toward Universal Design. In W.E. Preiser, JC. Vischer, E.T. White (Eds.), *Design Intervention: Toward a More Humane Architecture.* (32 pages)., New York: Van Nostrand Reinhold.

"…a sensible and economical way to reconcile the artistic integrity of a design with human needs in the environment. Solutions which result in no additional cost and no noticeable change in appearance can come about from knowledge about people, simple planning and careful selection of conventional products." (Mace, 1991)

Historical Perspective of UD

- 1950's – Disabled Veterans and others helped support the Barrier-Free movement
- 1960's - 1990's Civil Rights movement supported anti-discrimination laws
- In 1961, the American Standards Association published the first barrier- free standard entitled, *A 117.1-Making Buildings Accessible to and Usable by the Physically Handicapped*.
- In 1984, the Uniform Federal Accessibility Standard (UFAS) was created from the various State-adopted standards
- In 1990, the Americans with Disabilities Act was passed into law.
- From architecture to environmental initiatives, recreation, the arts, health care, and now to education.

Universal Design

- Not one size fits all – but alternatives.
- Designed from the beginning, not added on later.
- Increases access opportunities for everyone

Universal Design

- Ramps
- Curb Cuts
- Electric Doors
- Captions on Television
- Easy Grip Tools

UD Origin and Definitions

Drawbacks of Retrofitting

- Each retrofit solves only one local problem
- Retrofitting can be costly
- Many retrofits are UGLY!

UD Solutions

Principles of Universal Design

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

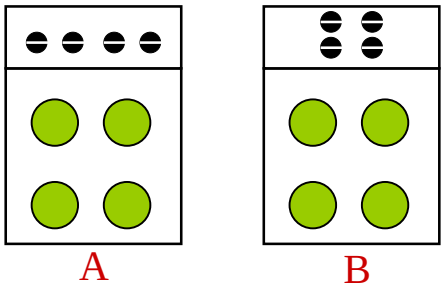
http://www.design.ncsu.edu:8120/cud/univ_design/princ_overview.htm

User Interface Design: A Quick Primer

Design Principle

Natural Mappings

Which is a better stove design? Why?



Design Principle: Affordances

Different media/materials lend themselves to different uses

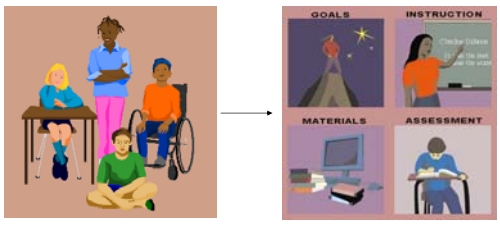
Design Principle

Give users a good conceptual model

During a weekend away an unusual cold front came through and your house is freezing. After switching to "heat", which of the following will heat your home the fastest?

- Turn the thermostat to 72
- Turn the thermostat to 80
- Turn the thermostat to 90
- Turn the thermostat to 60, then 65, then 72
- Other?

Origins of Universal Design for Learning (UDL)

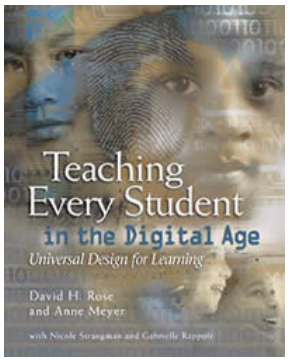


Origins of Universal Design for Learning (UDL)

CAST believes that "barriers to learning are not, in fact, inherent in the capacities of learners, but instead arise in learners' interactions with inflexible educational goals, materials, methods, and assessments."

Teaching Every Student in the Digital Age, p. vi

Teaching Every Student in the Digital Age: Universal Design for Learning



- Rose & Meyer, 2003
- Online copy free at CAST.org

Barriers to *Learning* Access

How many of you can explain (not solve) the following?

$$2 + 3 = ?$$

Barriers to *Learning* Access

How many of you can explain (not solve) the following?

$$8/2 = ?$$

$$8/1 = ?$$

$$8/0 = ?$$

Barriers to *Learning* Access

How many of you can explain the following?

$$\int dx = x$$

Barriers to *Learning* Access

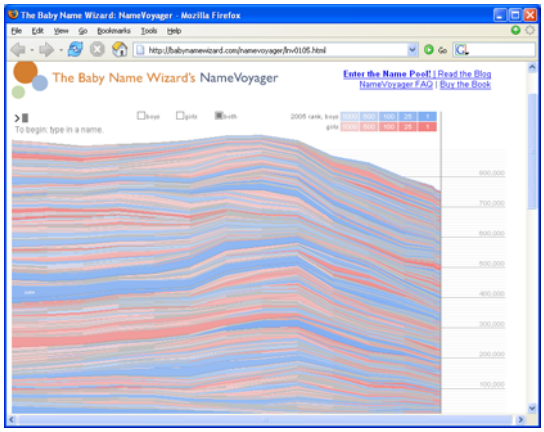
- The Power and Consequences of Representation

UDL Guidelines

I. Provide Multiple Means of Representation
- Perception
- Language and symbols
- Comprehension

II. Provide Multiple Means of Action and Expression
- Physical action
- Expressive skills and fluency
- Executive function

III. Provide Multiple Means of Engagement
- Recruiting interest
- Sustaining effort and persistence
- Self-regulation

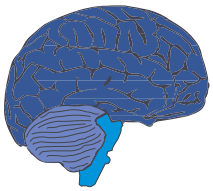


Origins of Universal Design for Learning (UDL)

Definition:

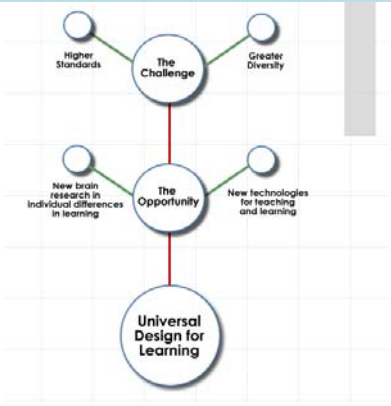
UDL is an educational approach to teaching, learning, and assessment, drawing on new brain research and new media technologies to respond to individual learner differences.

UDL and the Learning Brain



- Recognition network
- Strategic network
- Affective network

From Rose, David & Meyers, Ann (2003).



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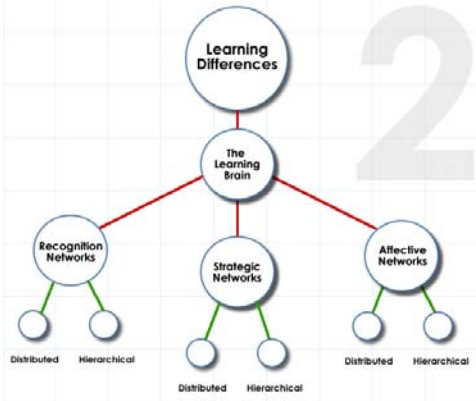
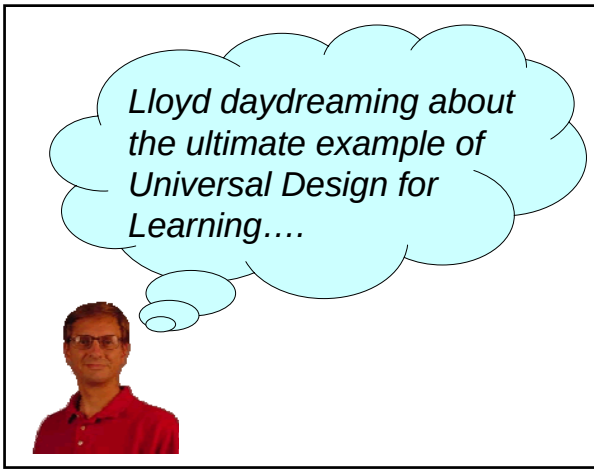
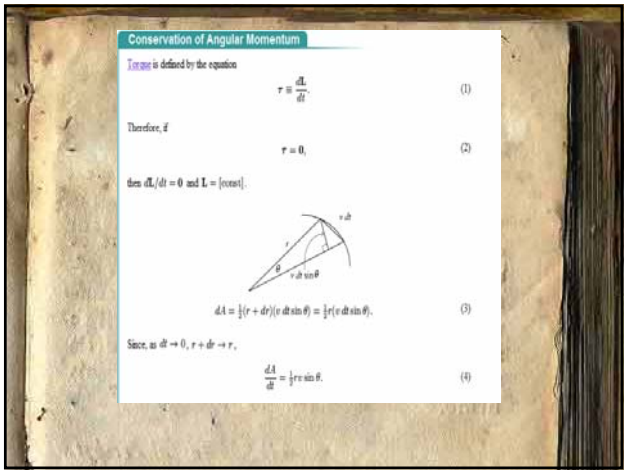
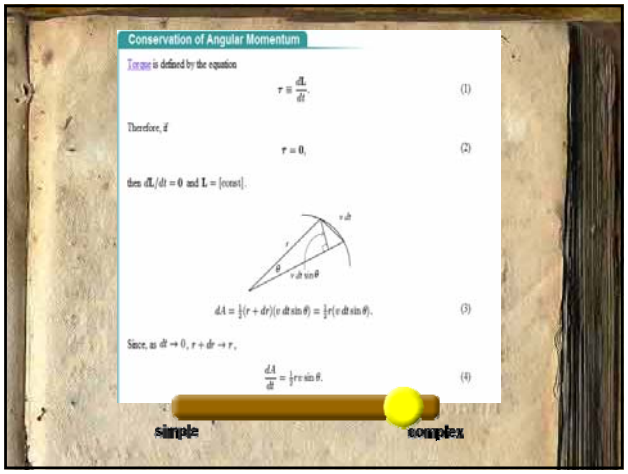
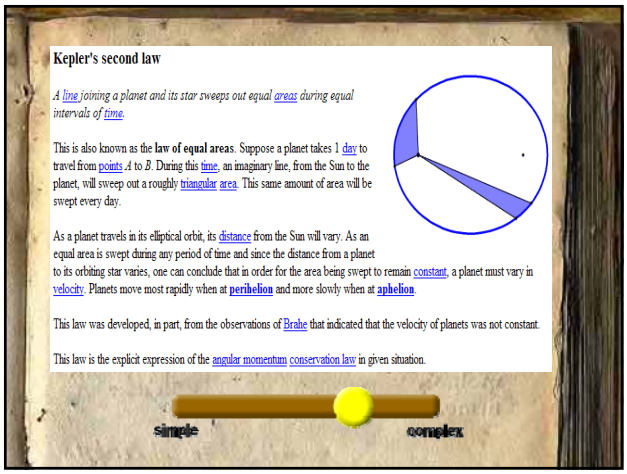
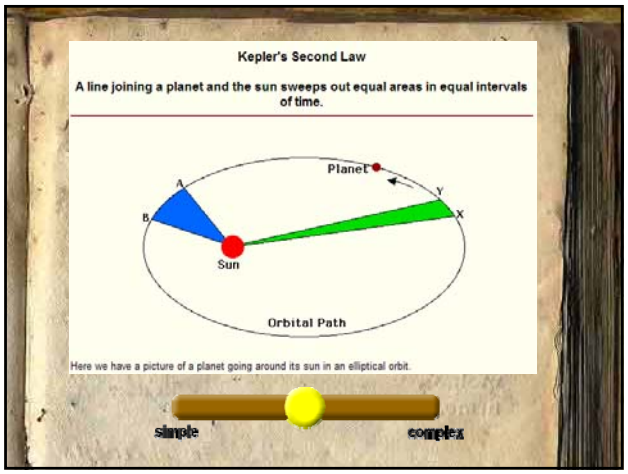


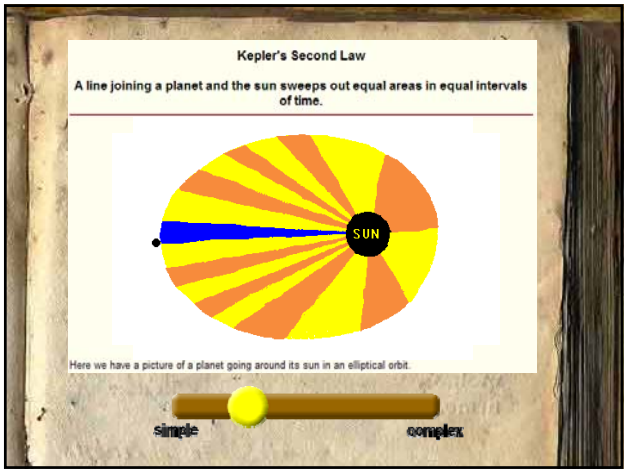








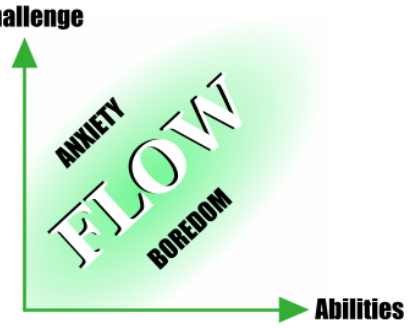




http://highered.mcgraw-hill.com/sites/0072482621/student_view0/interactives.html#

Motivation & Flow Theory

Mihaly Csikszentmihalyi



Rediscovering Gaming

High Tech, Low Tech, and Everything In-Between

Learning in a Game: Affective Domain

- Motivation
  - Competition, random features
  - Intrinsic motivation: You create your own reasons for participating
  - Triggering challenge and curiosity
  - A feeling of control, but with an edge of uncertainty

Learning in a Game: Cognitive Domain

- Meaningful, relevant context
- Active participation in an “interactive story”
- Organization, situation, goals, and feedback
  - Helps students to organize information, followed by putting knowledge to use
- Narrative: The power of stories
  - Myths & Archetypes (Joseph Campbell)

Game Design

- Optimizing challenge
  - What is your favorite sport?
  - Change one rule or the parameter of one game object.
  - What is the impact of this change on the game?

4.25 inches

Center court = 36 inches
Side posts = 42 inches

Kevin Ayres, Ph.D.
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The iSkills Project

iSkills

Mobile Video Repository to Support Individuals with Disabilities to Live Independently

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