Access and Technology: Promises and Pitfalls in Post-Secondary Education

RECAP Conference

West Chester University

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Learning Objectives

- Define universal design (UD) and universal design for learning (UDL)
- Describe the relationship between UDL, accessibility, and the use of technology in post-secondary instruction
- List three reasons for incorporating the principles of UDL in post-secondary instruction
- Identify two new strategies to employ "on Monday"

Who are you?

- Faculty in education?
- Faculty – other disciplines?
- Administrators?
- Disability services?
- IT/computer services?
- Students?
- Other?

Universal Design

- Term coined by Ronald Mace (1941-1998)
- Environments (including the "virtual world") and programs that meet the needs of as many users as possible
- "Human-centered design *with everyone in mind*"
- Encourages attractive, marketable products more usable by everyone
- Design catching up with demographics

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."

  Center for Universal Design at North Carolina State University: http://www.ncsu.edu/project/design-projects/udi/

- The key to accessibility is it should be easy for *everyone* to use, including people with disabilities

Who Benefits from Universal Design?

- People with learning differences
- People with situational limitations
- People whose first language differs from majority
- People in new environments, new situations
- People with disabilities
- **Can eliminate the need for assistance from devices (AT) and people – *promotes independent access***

Barrier-free Design

- Disability-focused movement, e.g. removing barriers for people with disabilities through codes and regulations (e.g. ADA, Section 508).
- Barrier-free design is a component of, but not equal to, the ADA
- Barrier-free designs might not be universal (e.g. left/right transfer “accessible bathrooms”)

Universal Design: Accessibility & Usability

Accessibility

- How barrier free is the design?
- Are there problems which make it more difficult for people with disabilities to access than people who do not have a disability
- Where are the accessible features?
- How well are they identified (signage)?

Accessible

- able to be reached or approached
- able to be used or obtained
- easy to appreciate or understand

Simple definition, Miriam-webster.com

Usable

- capable of being used
- convenient and practicable for use

Full definition, Miriam-webster.com

Universal Design: Accessibility & Usability

Usability

- How intuitive is the design, location, interaction, etc.?
- Can it be used for the purpose it was designed?
- Are designs consistent and easy to use?
- Can all people participate?
- How are staff trained to accommodate?

Universal Design: Accessibility & Usability

- Incorporates both **Accessibility** and **Usability**
- **Exceeds** minimum standards of compliance, accessibility, design or accommodation
- Anticipates use by people whose needs ***have yet to be considered***

Individual Accommodation vs. Universal Design

Individual Accommodation:

- Reaction to an individual's need
- Afterthought
- Can be more costly, time consuming, challenging and burdensome - "undue burden"
- **IEP/504**
- "layered on"

Universal Design:

- Plans for use, participation or access by a wide variety of people
- Incorporates accommodations into initial and on-going planning and design
- "baked in"

Universal Design

Curb Cut Principle:

Universal Design

Photo of an ugly ramp built onto an older brick building

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

A Preferred Approach

Photo of a home with multiple entries design into its construction

7 Principles of Universal Design

Concepts apply to:

- physical access
- learning strategies & tools
- participation in activities
- web environments
- devices and equipment

7 Principles of Universal Design

- Understands that design must incorporate considerations such as economic, engineering, cultural, gender, and environmental concerns in the design processes.
- All guidelines may not be relevant to all designs, not one size fits all.

http://www.youtube.com/watch?v=SyyZuvTXJpM&feature=related – Dublin overview

http://www.youtube.com/watch?v=1jB_cQWRRn0&feature=related - **Eurotrip!

Principle One: EQUITABLE USE

The design is useful and marketable to people with diverse abilities

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

Principle Two: FLEXIBILITY IN USE

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

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

Principle Three: SIMPLE & INTUITIVE

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

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

Intuitive?

Principle Four:
PERCEPTIBLE INFORMATION

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

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast
- Maximize "legibility" of essential information.

Principle Four: (con't) PERCEPTIBLE INFORMATION

- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations (hear what I see, see what I hear)

Perceptible?

Principle Five: TOLERANCE FOR ERROR

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

Principle Five: TOLERANCE FOR ERROR

-Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated or shielded.

-Provide warnings of hazards and errors

-Provide fail safe features

-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.

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

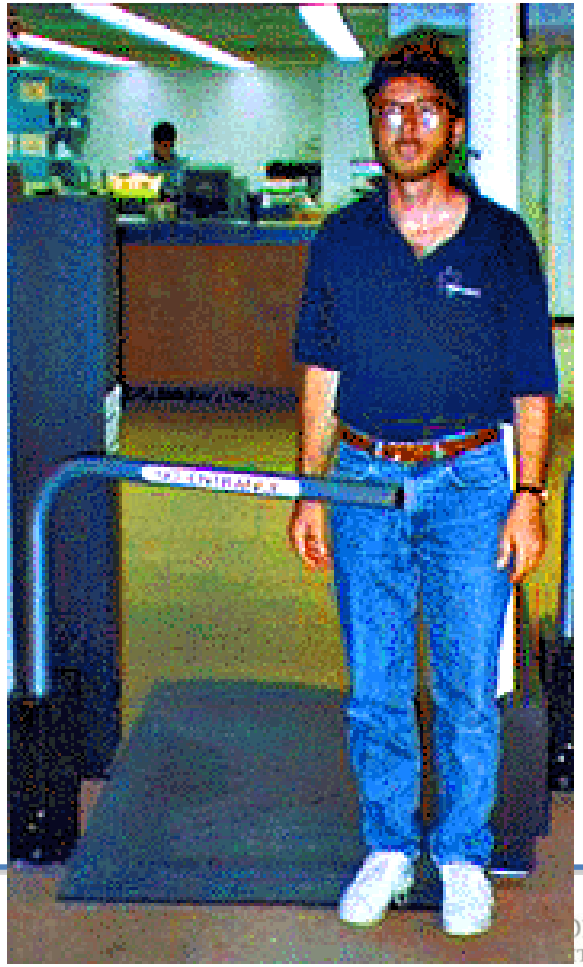
Principle Seven:
SIZE AND SPACE FOR APPROACH & USE

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture or mobility

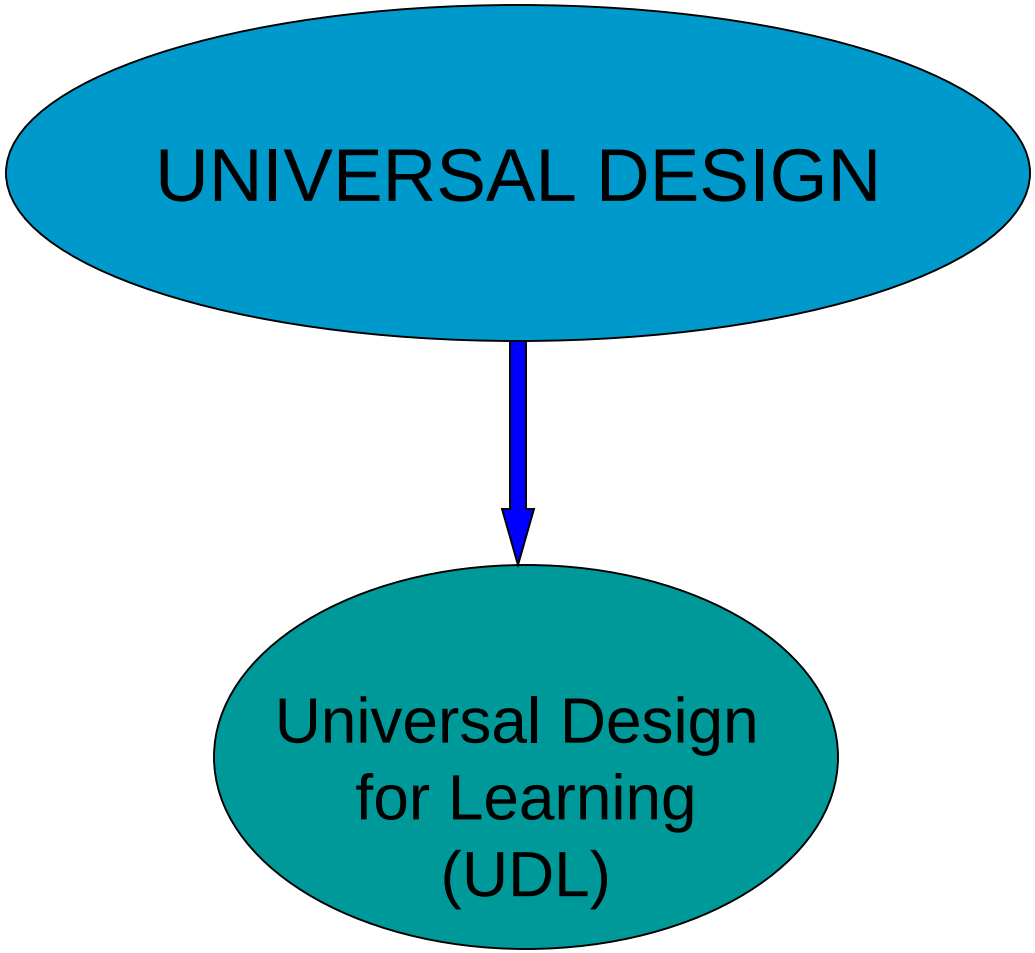
Principle Seven: (con't)
SIZE AND SPACE FOR APPROACH & USE

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

Size and space for approach and use?



CLEARING A PATH
FOR PEOPLE WITH SPECIAL NEEDS
CLEARS THE PATH FOR EVERYONE!


UNIVERSAL DESIGN
Universal Design
for Learning
(UDL)

Ban the average – design to the edges

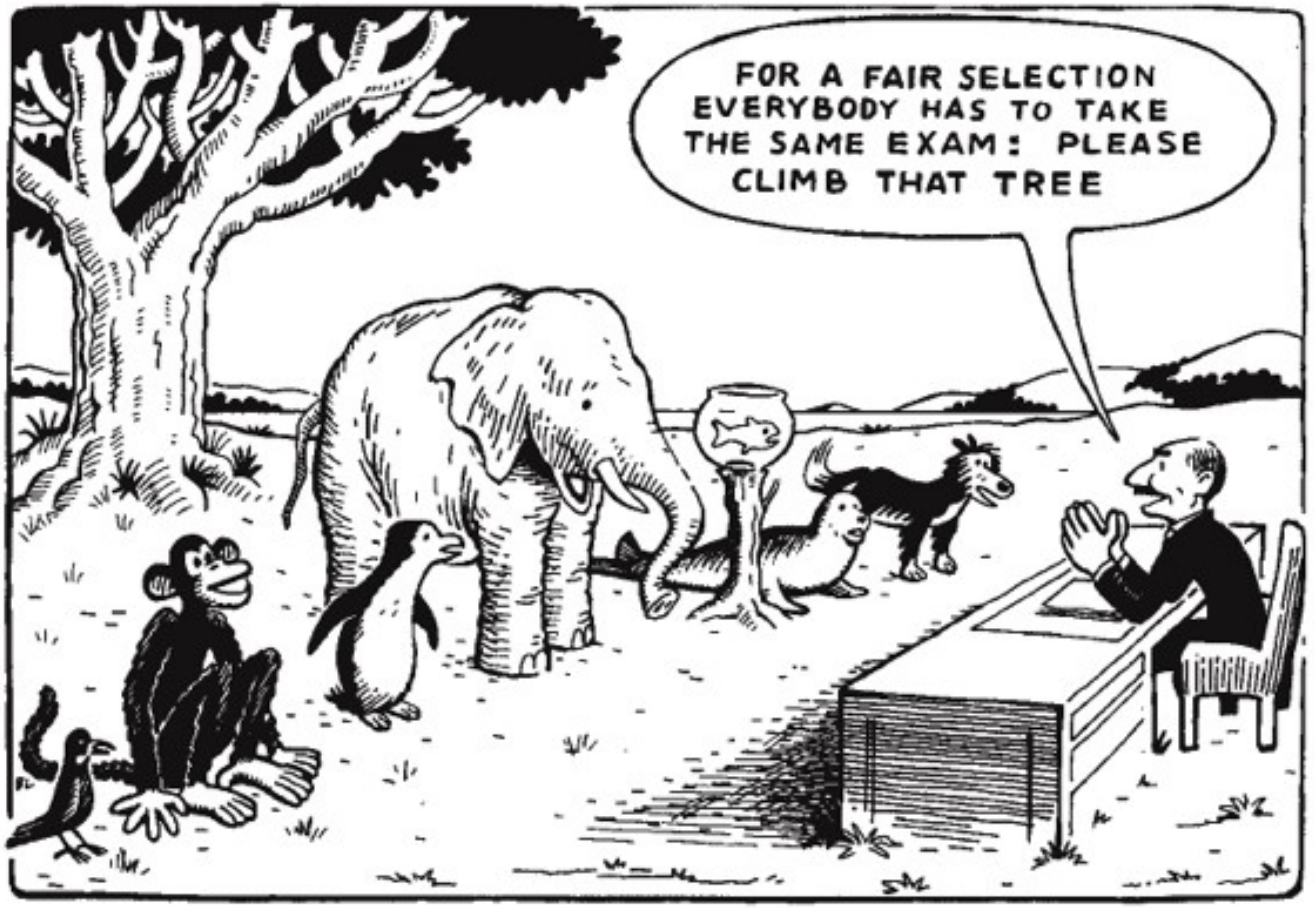
- http://www.youtube.com/watch?v=4eBmyttcfU4)

"If you design those learning environments on average, odds are you've designed them for nobody. So no wonder we have a problem. We've created learning environments that because they are designed on average cannot possibly do what we expected them to do which is nurture individual potential."

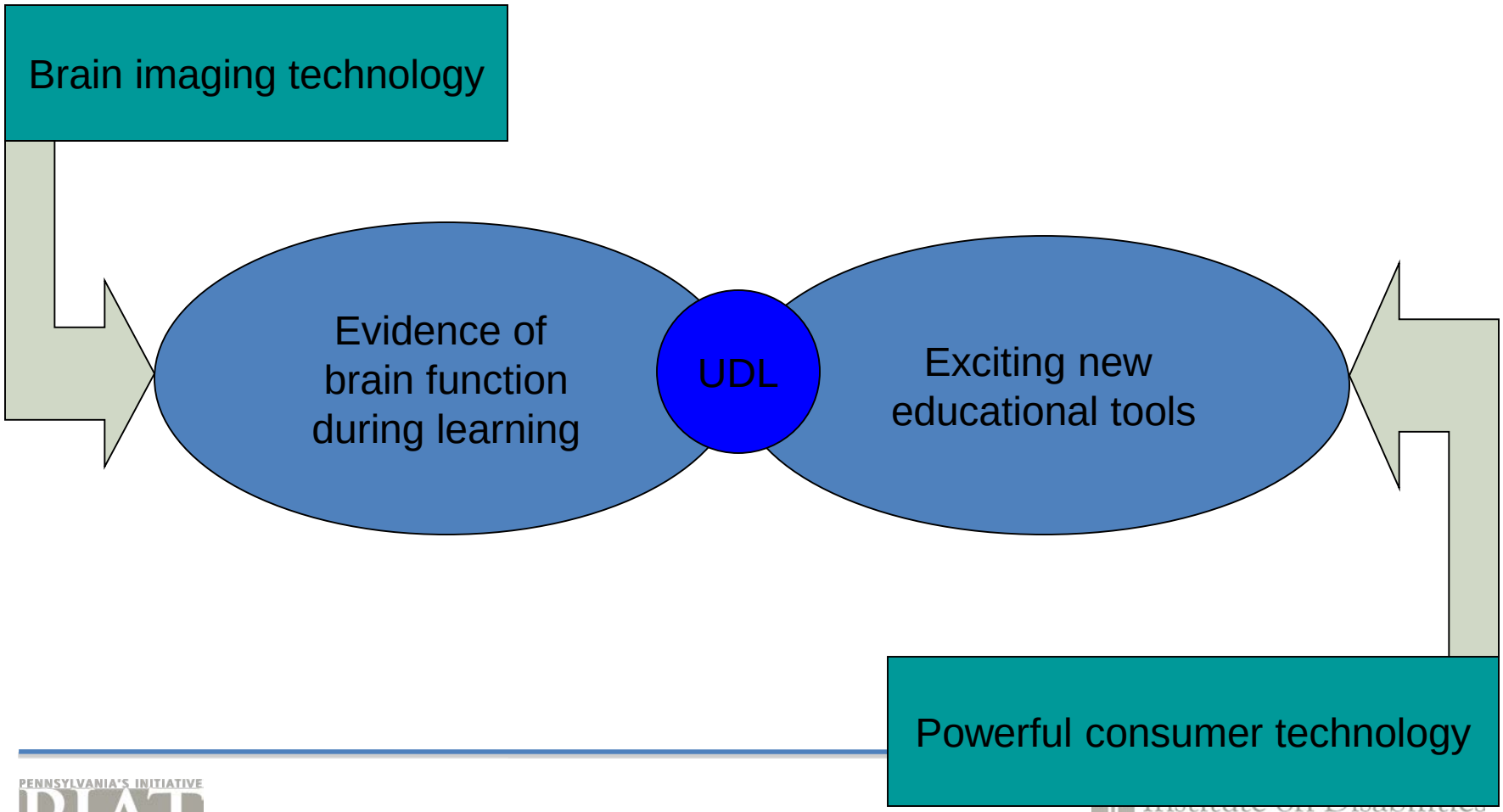
UD Principles Applied to Learning (UDL)

- Barriers aren't architectural; they're curricular
- Barriers arise in learners' interactions with inflexible educational goals, materials, methods, and assessments.*

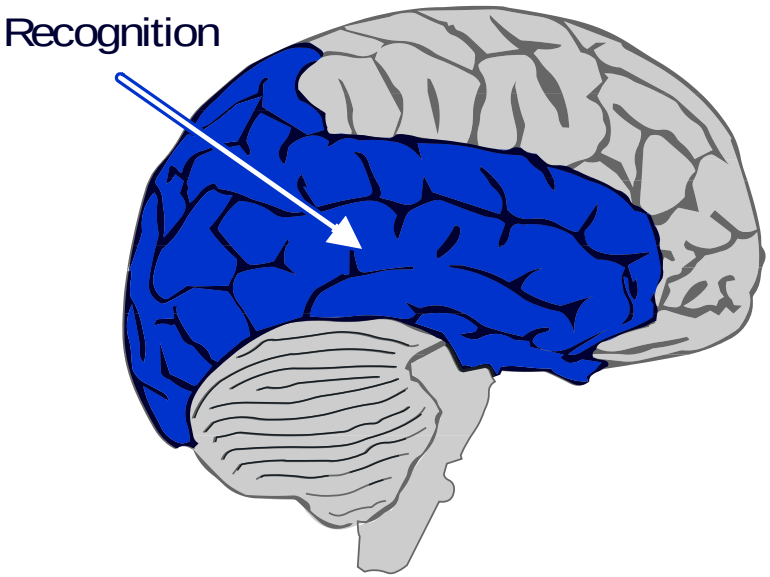
**Teaching Every Student in the Digital Age*, p. vi


FOR A FAIR SELECTION EVERYBODY HAS TO TAKE THE SAME EXAM: PLEASE CLIMB THAT TREE

The New Century gave us…



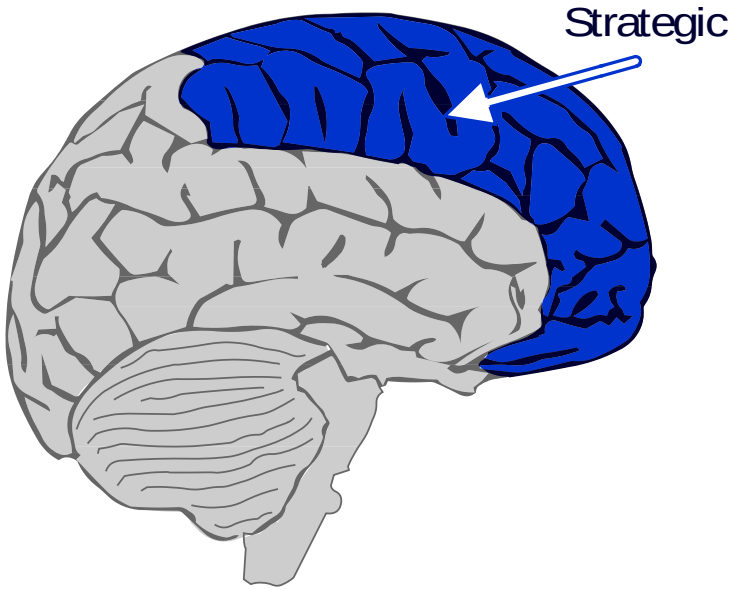
UDL and the Learning Brain



Recognition networks: “the what of learning”

- identify and interpret patterns of sound, light, taste, smell, and touch

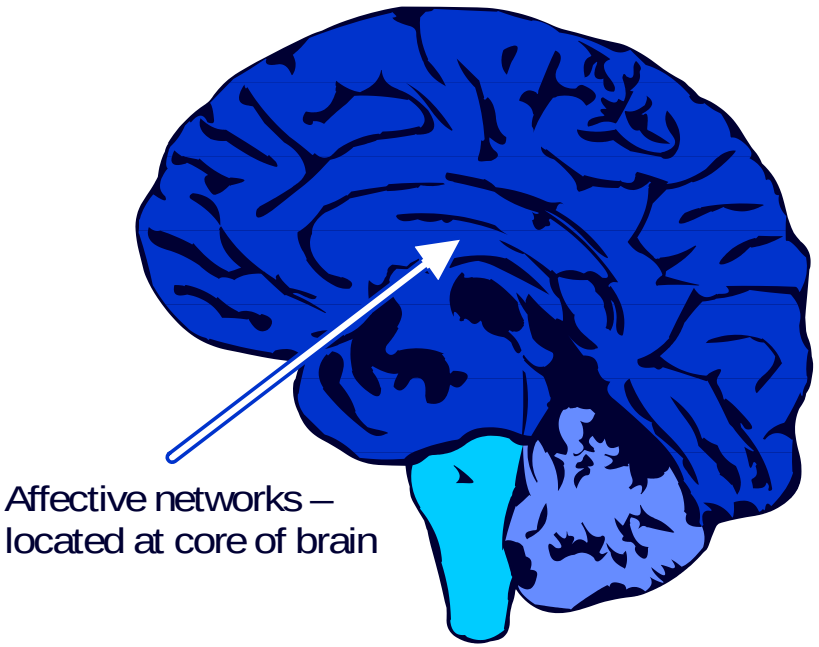
UDL and the Learning Brain



Strategic networks: "the how of learning"

- plan, execute, and monitor actions and skills

UDL and the Learning Brain



Affective networks: "the why of learning"; wanting to learn

- evaluate and set priorities

The Recognition Network

Demands that we identify the right means and methods for the uptake of information

In UDL-speak:

"Multiple means of representation"

The Strategic Network

Demands that we identify the right means and method for the demonstration of knowledge

In UDL-speak:

"Multiple means of expression"

The Affective Network

Demands that we identify the right means and methods for connecting students to learning and keeping them connected

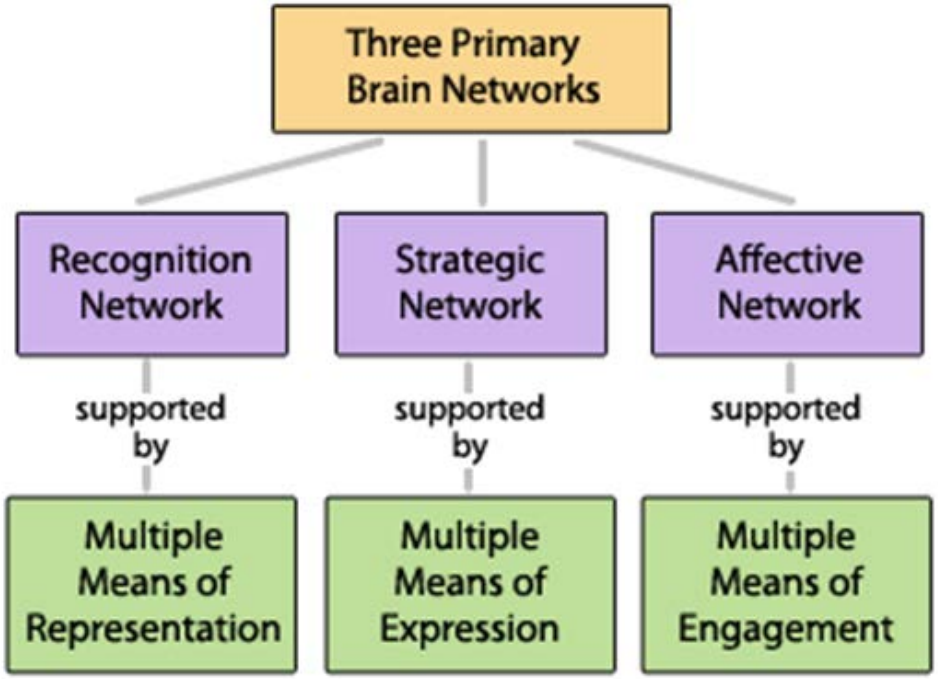
"Students will never use knowledge they don't care about, nor will they practice or apply skills they don't find valuable."

Rose, D. H., Harbour, W. S., Johnston, C. S., Daley, S. G., & Abarbanell, L. (2006).

In UDL-speak:

"Multiple means of engagement"

Summary:


Three Primary Brain Networks
Recognition Network
Strategic Network
Affective Network
supported by
supported by
supported by
Multiple Means of Representation
Multiple Means of Expression
Multiple Means of Engagement

Universal Design for Learning Guidelines

Provide Multiple Means of

Engagement

Purposeful, motivated learners

Provide options for self-regulation
+ Promote expectations and beliefs that optimize motivation
+ Facilitate personal coping skills and strategies
+ Develop self-assessment and reflection

Provide options for sustaining effort and persistence
+ Heighten salience of goals and objectives
+ Vary demands and resources to optimize challenge
+ Foster collaboration and community
+ Increase mastery-oriented feedback

Provide options for recruiting interest
+ Optimize individual choice and autonomy
+ Optimize relevance, value, and authenticity
+ Minimize threats and distractions

Provide Multiple Means of

Representation

Resourceful, knowledgeable learners

Provide options for comprehension
+ Activate or supply background knowledge
+ Highlight patterns, critical features, big ideas, and relationships
+ Guide information processing, visualization, and manipulation
+ Maximize transfer and generalization

Provide options for language, mathematical expressions, and symbols
+ Clarify vocabulary and symbols
+ Clarify syntax and structure
+ Support decoding of text, mathematical notation, and symbols
+ Promote understanding across languages
+ Illustrate through multiple media

Provide options for perception
+ Offer ways of customizing the display of information
+ Offer alternatives for auditory information
+ Offer alternatives for visual information

Provide Multiple Means of

Action & Expression

Strategic, goal-directed learners

Provide options for executive functions
+ Guide appropriate goal-setting
+ Support planning and strategy development
+ Enhance capacity for monitoring progress

Provide options for expression and communication
+ Use multiple media for communication
+ Use multiple tools for construction and composition
+ Build fluencies with graduated levels of support for practice and performance

Provide options for physical action
+ Vary the methods for response and navigation
+ Optimize access to tools and assistive technologies

Universal Design for Learning Guidelines

I. Provide Multiple Means of **Representation**

1: Provide options for perception

1.1 Offer ways of customizing the display of information

1.2 Offer alternatives for auditory information

1.3 Offer alternatives for visual information

2: Provide options for language, mathematical expressions, and symbols

2.1 Clarify vocabulary and symbols

2.2 Clarify syntax and structure

2.3 Support decoding of text, mathematical notation, and symbols

2.4 Promote understanding across languages

2.5 Illustrate through multiple media

3: Provide options for comprehension

3.1 Activate or supply background knowledge

3.2. Highlight patterns, critical features, big ideas, and relationships

3.3 Guide information processing, visualization, and manipulation

3.4 Maximize transfer and generalization

Resourceful, knowledgeable learners

II. Provide Multiple Means of **Action and Expression**

4: Provide options for physical action

4.1 Vary the methods for response and navigation

4.2 Optimize access to tools and assistive technologies

5: Provide options for expression and communication

5.1 Use multiple media for communication

5.2 Use multiple tools for construction and composition

5.3 Build fluencies with graduated levels of support for practice and performance

6: Provide options for executive functions

6.1 Guide appropriate goal-setting

6.2 Support planning and strategy development

6.3 Facilitate managing information and resources

6.4 Enhance capacity for monitoring progress

Strategic, goal-directed learners

III. Provide Multiple Means of **Engagement**

7: Provide options for recruiting interest

7.1 Optimize individual choice and autonomy

7.2 Optimize relevance, value, and authenticity

7.3 Minimize threats and distractions

8: Provide options for sustaining effort and persistence

8.1 Heighten salience of goals and objectives

8.2 Vary demands and resources to optimize challenge

8.3 Foster collaboration and community

8.4 Increase mastery-oriented feedback

9: Provide options for self-regulation

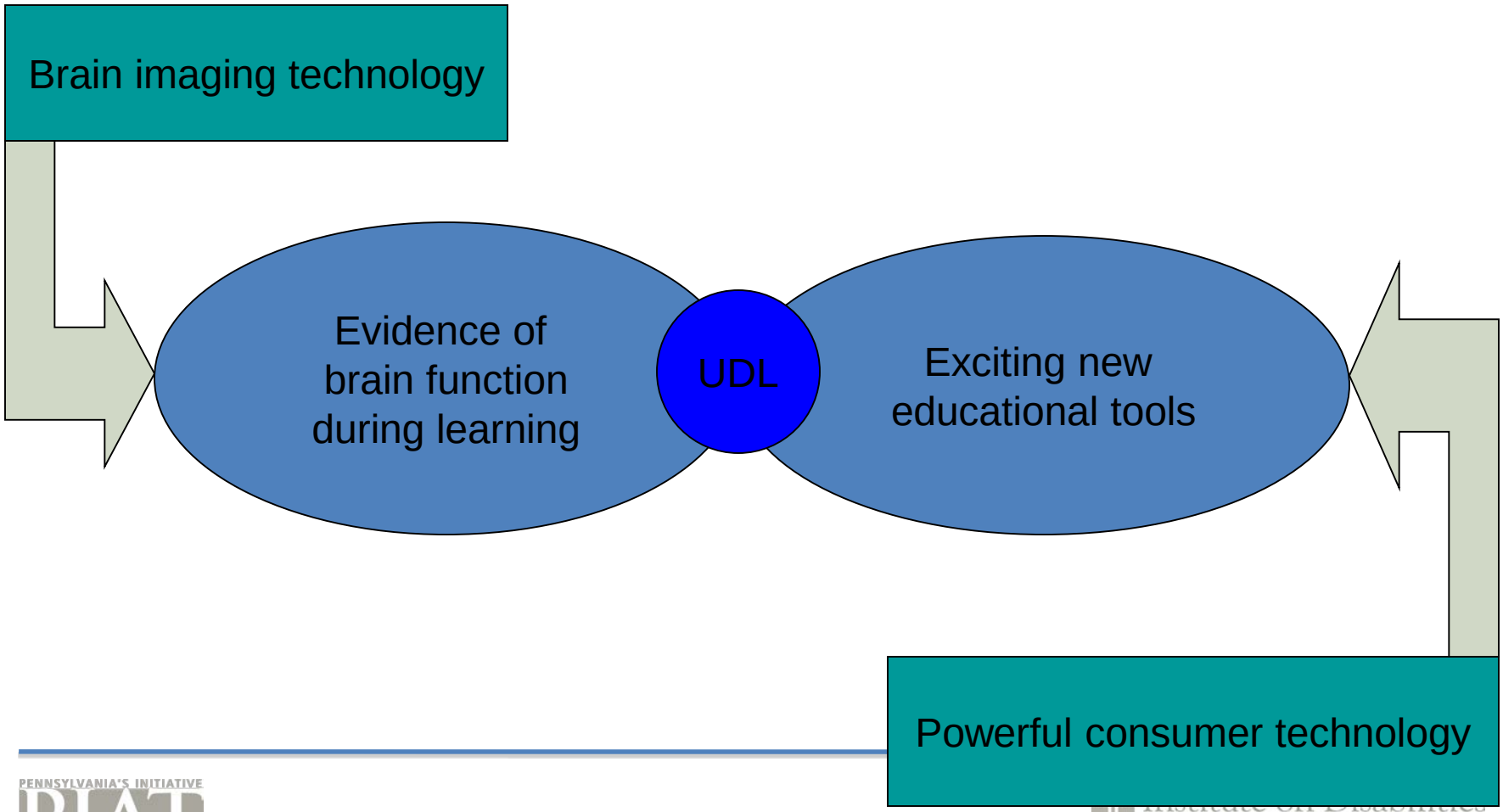
9.1 Promote expectations and beliefs that optimize motivation

9.2 Facilitate personal coping skills and strategies

9.3 Develop self-assessment and reflection

Purposeful, motivated learners

The New Century gave us…



The Case Against Technology

- *"Students today depend on paper too much. They don't know how to write on a slate without getting chalk dust all over themselves. They can't clean a slate properly. What will they do when they run out of paper?"*

  --Principals Association, 1815

- http://donjohnston.com/thecase/

Technology!

- New educational tools and assistive technology
- Powerful (and affordable) consumer technologies
- The web! And “Web 2.0”
- Ubiquitous internet access (almost)
- Digital text

Technology and UDL

Digital text is a key element

- It is transferable – movable from one application to another
- It is transformable – changeable from one medium to another
- It is malleable – customizable for the needs of each learner

UDL is…

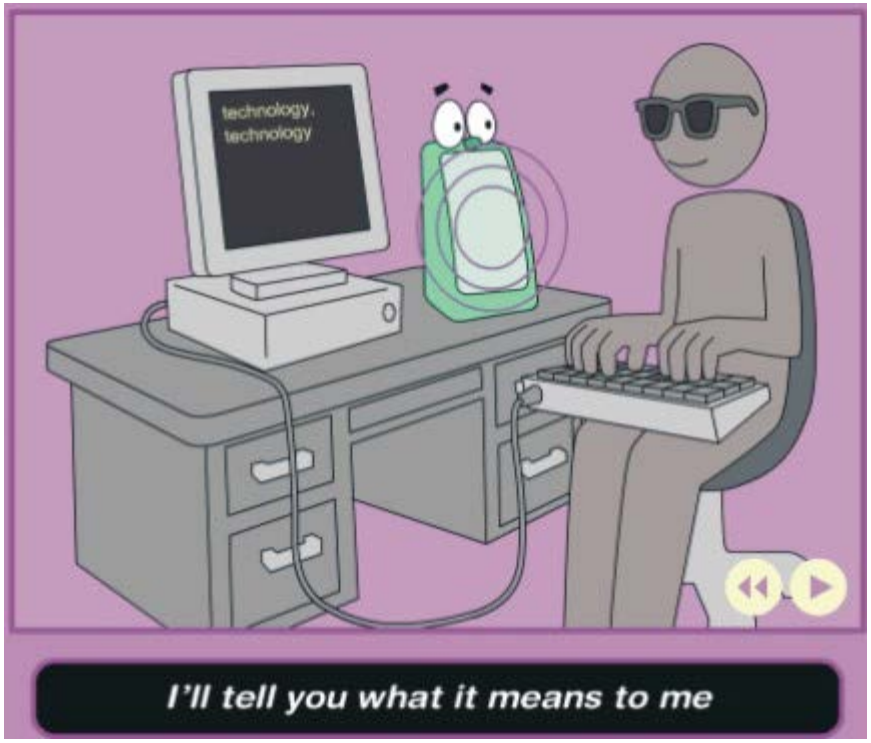
- An access to learning for all “thing”
- A means to respond to diversity in the classroom
- A way to improve access, participation, achievement, and retention
- A means to close achievement gaps
- “Inclusive instructional design”
- An approach that can minimize the need for individual accommodations (e.g. assistive technology).

Assistive Technology

- Any *thing* that helps **a person with a disability** do something she couldn't otherwise do (or do as readily as others).
- The *services* necessary to find, procure, customize, use, maintain the AT device.
- High tech, mid tech, low tech
- Every day technologies (e.g. smart phones) or highly specialized and purpose-built

AT Boogie

- https://www.youtube.com/watch?v=pVN9oSynWjg



AT and UDL

- AT looks at overcoming the barriers the individual faces in the environment.
- UDL looks at making the learning environment as flexible and accommodating as possible.
- Both approaches strive to insure the access, participation, and progress of students with disabilities.

Zabala & Stahl

AT and UDL

Universal design means a concept or philosophy for designing and delivering products and services that are usable by people with the widest range of functional capabilities, which include products and services that are directly usable (without requiring assistive technologies) and products and services that are made usable with assistive technologies.

--IDEIA (2004)

Individual Accommodation vs. Universal Design for Learning

Individual Accommodation:

- Reaction to an individual's need
- Afterthought
- Can be more costly, time consuming, challenging and burdensome - "undue burden"
- **IEP/504**
- "layered on"

Universal Design:

- Plans for use, participation or access by a wide variety of people
- Incorporates accommodations into initial and on-going planning and design
- "baked in"

Accommodation? or UDL?

- John, a student with vision loss, has ZoomText loaded on his laptop.
- CART is provided for a student with LD.
- Students may do their project individually or in a small group.
- Read and Write Gold is available to any student from the University's server.
- Answers to questions about Romeo and Juliet can be provided via page number citation or timed location from the RSC video.

Accessibility

- Your university “presence” - students, parents, alumni, funders, employees, community partners, etc.
- Your administrative applications – time keeping, self-service benefits for employees; registration; payment systems
- On-line learning courses and LMS

It's the Law!

- Civil rights violations – US DOJ involvement
- Captions; web access; MOOCs; online courses
- Students who are blind; students with learning disabilities; Deaf students
- Florida State; Louisiana Tech; Harvard; Penn State; MIT; Ohio State; on and on…
- http://www.d.umn.edu/~lcarlson/atteam/lawsuits.html

Web Accessibility

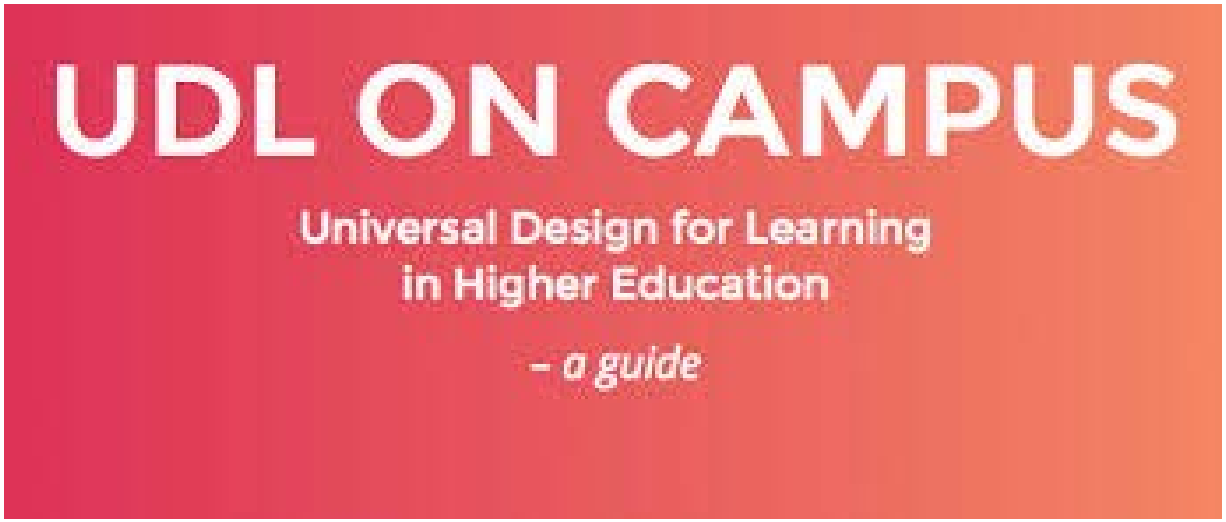
- “508” standards
- Web Content Accessibility Guidelines (WCAG 2.0) of the World Wide Web Consortium (W3C)
- “WAVE” your website! www.wave.webaim.org

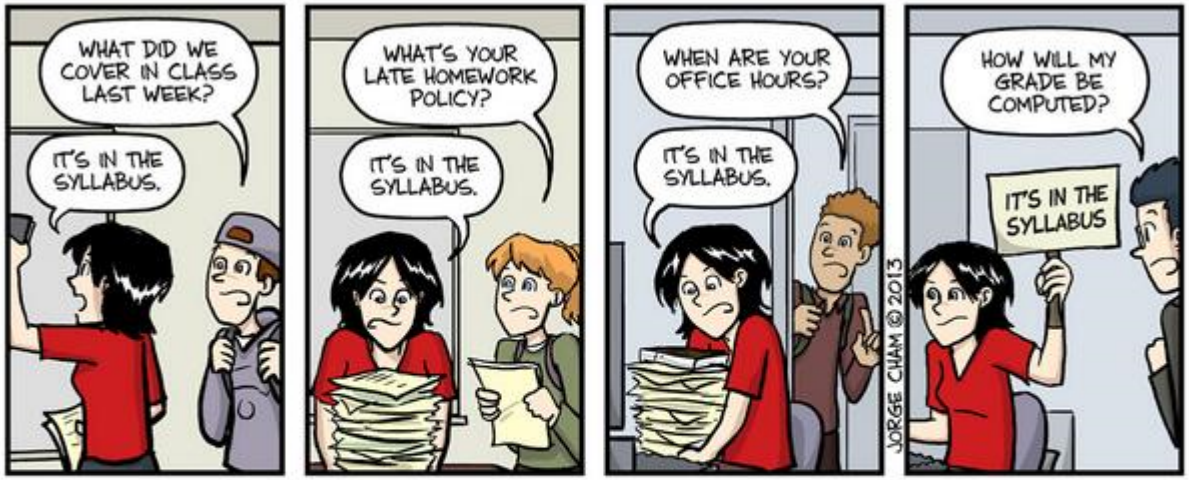
Web Accessibility Principles

- Perceivable (e.g. text alternatives)
- Operable (e.g. functionality via the keyboard)
- Understandable
- Robust (includes compatibility with AT)
- https://www.youtube.com/watch?v=-IWBT4Tk3t0

UDL on Campus

- https://www.youtube.com/watch?v=_HHvRzemuHA





IT'S IN THE SYLLABUS

This message brought to you by every instructor that ever lived.

WWW.PHDCOMICS.COM

Activity

- Find one example from the UDL Rubric for Evaluating Your Course Syllabus that illustrates each UDL principle:

(1) Multiple means of representation

(2) Multiple means of action and expression

(3) Multiple means of engagement

GO!

Julie

You spent all summer developing your online course, EDA 506-90 (Legal Issues in Special Ed).

You have just learned that Julie, a student who is hard of hearing, will be taking the course.

What do you want to know about Julie?

What do you want to check in your course?

Julie

- Am I requiring videos or pre-recorded lectures (e.g. capture)? If so: are they captioned (and what is the quality of the captioning) or is there a transcript?
- How will I manage a live chat?
- If it is a blended course: for the in-person classes what accommodations does she need (preferential seating? Assistive listening devices? Note-taking/CART?

Sam

- This is the 3rd time you are teaching this course.
- Two weeks into the semester, Sam , a student with vision disabilities, adds your course.
- What do you want to know about Sam?
- What do you want to check in your course?

Sam

- Does Sam use any AT?
- Are my handouts/readings available in text accessible version (e.g. not scanned images)
- Did I select a version of the textbook that is available digitally? Is the digital version accessible? And immediately available?
- If I have required videos, are they audio-described or is there a transcript available?

Lisa, Leo, and Lewis

- After the fifth week of class and the first exam, these three students are having difficulty in your class. They meet with you individually and reveal they have learning disabilities. Only Lisa is registered with Disability Services.
- What do you want to know about these students?
- What do you want to check in your course?

Lisa, Leo, and Lewis

- What accommodations does Lisa require, in accordance with Disability Services?
- What accommodations do Lila and Lewis think they need?
- Might those accommodations entail the use of strategies and technologies that make the course more accessible to all your students?
- What changes can you implement now, to improve access for all your students (UDL)?

Resources

- http://www.washington.edu/doit/universal-design-postsecondary-education-process-principles-and-applications
- http://www.udlcenter.org/implementation/postsecondary
- http://www.flconsortiumudl.net
- http://www.accessibility.temple.edu
- https://www.youtube.com/watch?v=j7eUf_7dZVM (Colorado)

Resources

- http://www.udlresource.com/
- http://www.flconsortiumudl.net
- https://www2.ed.gov/about/bdscomm/list/aim/meeting/aim-overview.html (US DOE Commission on AIM in Postsecondary Education)
- Teach UDL to the next generation of teachers!

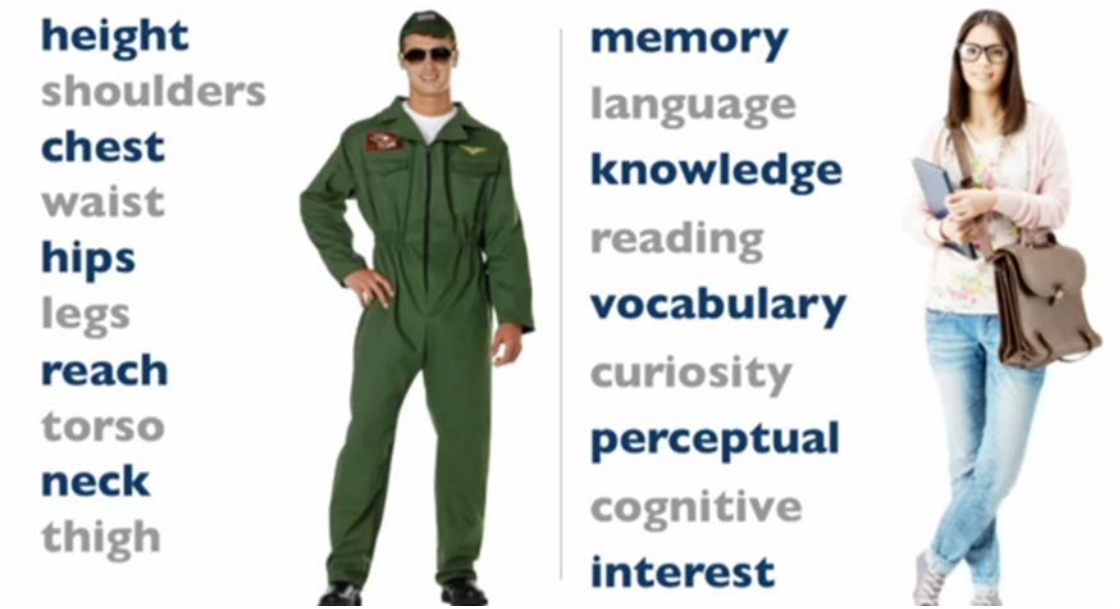
  http://community.udlcenter.org/

True or False?

- UDL is a beverage.

True or False?

- Universal design means designing for “average”



True (yellow) or False (lilac)?

- I can apply principles of UDL to the next course I teach.
- I know where to go for assistance with applying UDL to my courses.
- I know more about teaching UDL principles to the next generation of educators.

PENNSYLVANIA'S INITIATIVE

PIAT

ON ASSISTIVE TECHNOLOGY

Institute on Disabilities
TEMPLE UNIVERSITY®
College of Education

FOR INFORMATION contact:

PIAT - Pennsylvania's Initiative on Assistive Technology

1755 N. 13th Street
Suite 411S
Philadelphia, PA 19122

Tel: 800-204-7428 (voice)
866-268-0579 (TTY)

Fax: 215-204-6336

Email: ATinfo@temple.edu

Web:

http://disabilities.temple.edu/piat


THE
END