Introduction to Universal Design for Learning
LEVinar
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Introducing the Presenter

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Sources
45 Minute Road Trip

Introduction to Universal Design & Learner Variability

The UDL Framework

Learning Neural Networks

Q & A

Introduction to Universal Design & Learner Variability
Learning Objectives

- Participants will gain a basic understanding of the framework of Universal Design for Learning (UDL)
- Participants will gain an understanding of the neural networks that are involved in learning.
How familiar are you with UDL?

One-to-Five

(CAST, 2018)
Universal Design for Learning (UDL) is an educational framework based on research in learning sciences, including cognitive neuroscience, that guides the development of flexible learning environments that can accommodate individual learning differences.

(CAST, 2018)
Hey Siri, read that text to me.
Roots in Architecture & Product Development

Universal Design in architecture and product development illustrates that designing for variability from the beginning is more practical, elegant and effective approach than adding it on.
“Consider the needs of the broadest possible range of users from the beginning.”

Ron Mace
Core Concept:

What is necessary for some is beneficial for everyone.
Learner Variability
Exploring Variability: Attention Test

(Meyer et. al., 2014)
Moving from disability to Variability mindset

Recent advances in neuroscience have provided different understanding of individual differences, characterizing them instead as predictable, normal variability that exists across the population.

(Meyer et. al., 2014)
Brain Variability

- Individuals with and without autism were asked to complete an intelligence measure called the Raven’s Progressive Matrices.

- There was little difference in most parts of the brain.

- Except in the area of complex visual cortex – highlighted in yellow.

(Meyer et. al., 2014)
Brain Variability

- The highlighted yellow portion does not indicate damage or dysfunction.
- Individuals with autism generally show superior performance on this task.

*This is not disability.*

*This is variability!*

(Meyer et. al., 2014)
Systematic Learning Variability

“We’ve identified three dimensions of systematic variability that will exist in every learning environment at every age. Differences in terms of the way that people receive information, differences in the way that they engage with the material, and differences in the way that they can act upon material and show what they know.”

- Dr. Todd Rose
Core Concept:

Variability is Predictable
UDL as a Framework

Eliminating barriers
Eliminate Barriers

Universal Design for Learning seeks to **illuminate** the barriers from the inception of a lesson plan.

UDL maximizes the 3 networks in the brain that allow groups of learners the flexibility of taking in information in a way that is unique to their individual needs.

(Meyer et. al., 2014)
The barrier is in the environment, not the learner

(CAST, 2018)
UDL: The Process

Set Clear, Rigorous, Relevant Goals

Anticipate Barriers (Think about Learner Variability)

Design Options to Reduce Barriers for All
Goals: Clarifying Expectations

Students will write a 5-paragraph essay describing the phases of butterfly metamorphosis

Students will demonstrate understanding of the phases of butterfly metamorphosis
Core Concept:

UDL seeks to anticipate barriers within the design of the lesson and maximize flexibility to provide access to all learners.
Introduction to the UDL Guidelines
The Goal of the UDL Guidelines: Expert Learning

Provide multiple means of Engagement
- Affective Networks
  - The "WHY" of Learning

Provide multiple means of Representation
- Recognition Networks
  - The "WHAT" of Learning

Provide multiple means of Action & Expression
- Strategic Networks
  - The "HOW" of Learning

**Expert learners** who are...
- Purposeful & Motivated
- Resourceful & Knowledgeable
- Strategic & Goal-Directed
Three primary classes of learning neural networks

**Affective networks** monitor internal and external environments to set priorities, to motivate, and to engage the learner.

**Recognition networks** that sense and perceive information in the environment and transform it into usable knowledge.

**Strategic networks** that plan, organize and initiate purposeful actions in the environment.

(Meyer et. al., 2014)
Affective neural networks

- Affective networks are specialized – they are composed of many parts that all serve a specific purpose – example: amygdala and fear.
- Certain stimuli can initiate powerful feelings of fear.
- The amygdala relies on the cerebral cortex to evaluate information as threatening or benign.
- Bi-directionality in the nervous system suggests that emotion and cognition are completely intertwined. Separating them is not practical or useful!

(Meyers et. al, 2014)
Affective networks | An Unexpected Visitor

- Experience your own affective networks at work
- Review the painting on the next slide
- Please make a mental note of what object or person you notice first.
An Unexpected Visitor
Alfred Yarbus
1967

(Meyers et.al, 2014)
An Unexpected Visitor
Alfred Yarbus
1967

What did you notice first?
A. The man in the coat
B. The maid at the door
C. The child in white
D. None of these

(Meyers et.al, 2014)
What options could be added to recruit the interest of learners in the goal?

What options could be added to support learners to sustain effort and persistence in working toward the goal?

What options could be added to support learners to self-regulate during the activity?

(CAST, 2018)
Provide multiple means of Engagement

Provide options for Recruiting Interest
- Optimize individual choice and autonomy
- Optimize relevance, value, and authenticity
- Minimize threats and distractions

Provide options for Sustaining Effort & 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 Self Regulation
- Promote expectations and beliefs that optimize motivation
- Facilitate personal coping skills and strategies
- Develop self-assessment and reflection

Strategies for Success

- Offer flexible workspaces
- Provide mastery oriented feedback
- Promote growth mindset for students and staff
Recognition neural networks

- Our expectations about what we are seeing can warp what we do see.
- Contextual factors have been shown to have a strong influence on perception and recognition.
- Different representations are recognized in different parts of the brain.

(Meyers et al., 2014)
Recognition networks

http://www.michaelbach.de/ot/lum-adelsonCheckShadow/
Recognition networks

Image of the checkerboard

Cover drawn

(Meyers et.al, 2014)
An Unexpected Visitor
Alfred Yarbus
1967

(Meyers et.al, 2014)
An Unexpected Visitor
Alfred Yarbus
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(Meyers et.al, 2014)
What options could be added to ensure all learners can **perceive** the information?

What options could be added to ensure all learners **understand** the language and symbols?

What options could be added to ensure all learners are able to **comprehend** the information?

(CAST, 2018)
Strategies for Success

- Embed the [Read&Write](#) toolbar
- Use the [Frayer model](#)
- Use [Padlet](#) to help supply background knowledge
Strategic neural networks

- Strategic networks allow us to plan, execute and monitor all kinds of purposeful acts in our environment – ranging from simple motor acts to complex skills.

- They also are the networks for executive functions such as setting broad, long term goals, making plans for effective strategies, monitoring progress, making corrections if needed.

- When two individuals confronted with the same problem, they solve it a different way – using different patterns within their brain.

(Meyers et.al, 2014)
An Unexpected Visitor
Alfred Yarbus
1967

(Meyers et.al, 2014)
Strategic networks

(Meyers et.al, 2014)
• Patterns of eye movement vary depending on the task
• This is an image of the same viewer examining the photo on separate occasions.
• The viewer had a separate goal with each view.
• Even processes that seem simple involve complex, layered processes in the break.

(Meyers et.al, 2014)
What options could be added to ensure that all learners can physically interact with the materials and respond during the activity?

What options could be added to ensure that all learners can express learning and communicate during the activity?

What options could be added to ensure that all learners are able to plan and organize their own learning?

(CAST, 2018)
Strategies for Success

- Use the **show me your cards strategy**
- Use **Twitter-style exit slips**
- Help students to **track the passage of time**
Reflection Activity

Create a tweet explaining your catchy understanding of UDL.

Must be 280 characters or less!

Options for this reflection:

- Create a real tweet @edVoters #LEVinarUDL
- Record your response as a video
- Write your reflection on paper
Strategies you may have noticed in this presentation...

**Engagement**
- Activate prior knowledge
- Self Assessment

**Representation**
- Closed Captioning
- Color Coding

**Action & Expression**
- Visual Timer
- Progress monitor
Digital Resources

Padlet: