Introduction to Universal Design for Learning

Investing in Student Potential

1.28.2020
Agenda

- Introduction to Universal Design & Learner Variability
- The UDL Framework
- Learning Neural Networks
- Q & A

Introduction to Universal Design & Learner Variability
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.”
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.
Exploring Variability: Attention Test

(Meyer et. al., 2014)
Variability mindset

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

(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
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.
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
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.
- Certain stimuli can initiate powerful feelings of fear.
- 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)
Provide multiple means of Engagement

Affective Networks
The "WHY" of Learning

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/

(Meyers et.al, 2014)
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
1967

(Meyers et.al, 2014)
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.
Provide multiple means of Action & Expression

Strategic Networks
The “HOW” of Learning

Provide options for Physical Action
- Vary the methods for response and navigation
- Optimize access to tools and assistive technologies

Provide options for Expression & 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 Executive Functions
- Guide appropriate goal-setting
- Support planning and strategy development
- Facilitate managing information and resources
- Enhance capacity for monitoring progress

Strategies for Success

- Use the show me your cards strategy
- Use Twitter-style exit slips
- Help students to track the passage of time
### The Universal Design for Learning Guidelines

#### Provide multiple means of Engagement
- **Affective Networks**
  - The “WHY” of learning
- **Recognition Networks**
  - The “WHAT” of learning
- **Strategic Networks**
  - The “HOW” of learning

#### Provide options for Recruiting Interest
- **Access**
  - Optimise individual choice and autonomy
  - Optimise relevance, value, and authenticity
  - Minimise threats and distractions

#### Provide options for Sustaining Effort & Persistence
- **Build**
  - Heighten salience of goal and objectives
  - Vary demands and resources to optimize challenge
  - Foster collaboration and community
  - Increase mastery-oriented feedback

#### Provide options for Self Regulation
- **Internalise**
  - Promote expectations and beliefs that optimize motivation
  - Facilitate personal coping skills and strategies
  - Develop self-assessment and reflection

#### Provide options for Comprehension
- **Comprehend**
  - Activate or supply background knowledge
  - Highlight patterns, critical features, logic, and relationships
  - Guide information processing and visualization
  - Maximize transfer and generalization

#### Provide options for Physical Action
- **Physical Action**
  - Vary the methods for response and navigation
  - Optimize access to tools and assistive technologies

#### Provide options for Language & Symbols
- **Express**
  - 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 Expression & Communication
- **Communicate**
  - Use multiple media for communication
  - Use multiple tools for construction and composition
  - Build fluency with gradual release of support for practice and performance

#### Provide options for Executive Functions
- **Execute**
  - Guide appropriate goal-setting
  - Support planning and strategy development
  - Facilitate managing information and resources
  - Enhance capacity for monitoring progress

### Expert learners who are...
- **Purposeful & Motivated**
- **Resourceful & Knowledgeable**
- **Strategic & Goal-Directed**

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Strategies you may have noticed in this presentation...

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<thead>
<tr>
<th>Engagement</th>
<th>Representation</th>
<th>Action &amp; Expression</th>
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</thead>
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<tr>
<td>- Activate prior knowledge</td>
<td>- Closed Captioning</td>
<td>- Visual Timer</td>
</tr>
<tr>
<td>- Self Assessment</td>
<td>- Color Coding</td>
<td>- Progress monitor</td>
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Digital Resources

Padlet:

QR Code: