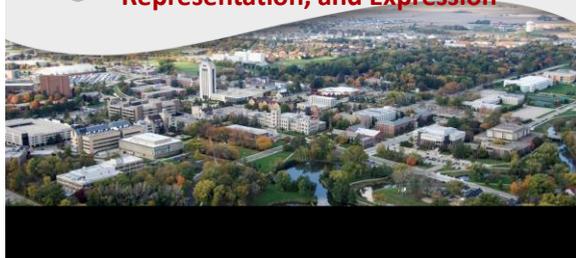




Exploring Principles of Universal Design for Learning (UDL): Multiple Means of Engagement, Representation, and Expression



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Agenda

- Introduction and Overview of Universal Design for Learning
- Developing education materials for learners with a range of abilities
 - Multiple Means of Engagement
 - Multiple Means of Representation
 - Multiple Means of Expression
- Questions & Discussion



Universal Design Learning

Universal Design is 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

– 1997 NC State University, The Center for Universal Design



5

Universal Design for Learning

- Universal – background, strengths, needs, and interests
- Curriculum should provide learning opportunities for each and every student



6

Universal Design for Learning

- Learning – Neuroscience tells us that our brains have three broad networks



Affective Networks - Engagement

- The Why of Learning
Enthusiasm



7

Universal Design for Learning

- Learning – Neuroscience tells us that our brains have three broad networks



Recognition Networks - Representation
The What of Learning Knowledge



Universal Design for Learning

- Learning – Neuroscience tells us that our brains have three broad networks

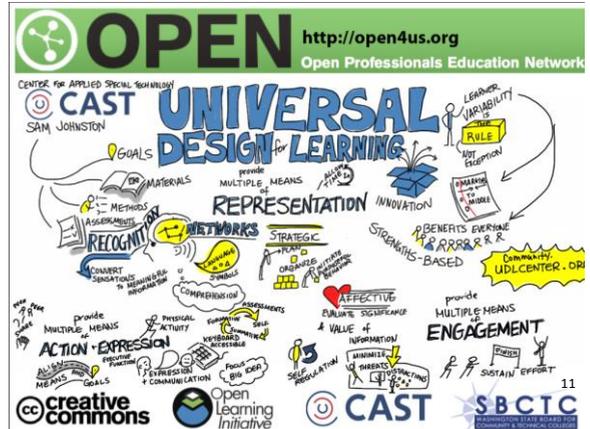


Strategic Networks - Action and Expression -
The How of Learning Skills and Strategies



Universal Design of Learning (UDL)

- Design of instruction to be usable by all students, without the need for adaptation or specialized design
- Not accommodation – benefits all
- Philosophical Framework



Origins of Universal Design for Learning (UDL)

The Center for Applied Technology (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 (CAST, 2003)

<http://lessonbuilder.cast.org/learn.php>



Universal Design Learning

- Learning happens in an interaction
- Learning is social and contextual



Two Knowledge States in the context of learning

- Person's functional level of knowledge
- Person's optimal level of knowledge



Expert Learning Environment/system is conducive to:

- Being motivated to learn
- Becoming knowledgeable about learning
- Becoming strategic about learning



Learning

- Not simply a process of absorbing
- Deepening our participation
- Engenders continuous development in individuals and in the community itself



19

- Focus on facilitating expert learners who are eager and ready to keep learning
- Dynamic, flexible learning environments



- Learners are highly variable
- Learners share common, predictable patterns of variability



Universally Designed Curriculum

- Provides for learners with a wide range of differences
- Multiple means of engagement, representation, and expression



Factors influencing variability

- A single class may include students who struggle to learn for any number of reasons, including:
 - Learning disabilities
 - Sensory and physical disabilities
 - English language barriers
 - Cultural barriers or customs
 - Emotional or behavioral problems
 - Limited access to and/or experience with using technology
 - Learning styles



Provide Multiple Means of
Engagement
Purposeful, motivated learners



Provide Multiple Means of
Representation
Resourceful, knowledgeable learners



Provide Multiple Means of
Action & Expression
Strategic, goal-directed learners

Affective

Recognition

Strategic

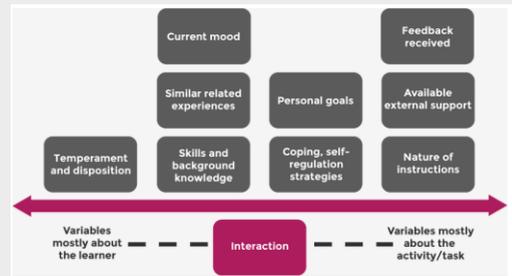


Affective Networks

Universal Design for Learning

Affective networks: THE WHY OF LEARNING	Recognition networks: THE WHAT OF LEARNING	Strategic networks: THE HOW OF LEARNING
How learners get engaged and stay motivated. How they are challenged, excited, or interested. These are affective dimensions.	How we gather facts and categorize what we see, hear, and read. Identifying letters, words, or an author's style are recognition tasks.	Planning and performing tasks. How we organize and express our ideas. Writing an essay or solving a math problem are strategic tasks.
Stimulate interest and motivation for learning	Present information and content in different ways	Differentiate the ways that students can express what they know

<http://udlincampus.cast.org/home#VQ9bZfCCv>



Engagement: Affective Network

Issues to consider –

- Student interests, choice, authenticity
- Do students think they can be successful?
- Provide clear expectations to optimize motivation
- Provide different levels of challenge
- Balance demands and resources



Affective (CAST)

MULTIPLE MEANS OF ENGAGEMENT

This principle focuses on how learners can become engaged and stay motivated and whether they feel challenged, excited, and interested in what they are learning (CAST, 2011). Without engagement, learners will struggle to attend to content and make deep learning connections.

Adjust the activity/task

Add choice in the selection of activities when possible.
Offer scaffolded challenges that vary in degree of difficulty.
Create learning communities that connect content to interdisciplinary topics and personal interests.

Support the learner to cope with challenges within the activity/task

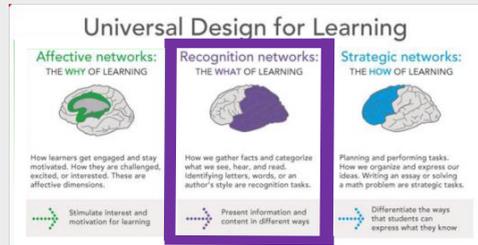
Set the tone by making it clear that student emotional engagement and motivation matters.
Embed self-checks in task and ask students to rate the difficulty of a task.
Support relevance and persistence through tasks by making the purpose explicit.
Offer clear expectations that support motivation.

Examples

- **Social learning communities**
 - Creativity and collaboration
 - Group problem solving
 - Social and academic engagement
- **Case-based learning**
 - Workplace story
 - Model of best practices in workplace
 - Learners collaborate to solve problems
 - Multiple perspectives



Recognition Networks



To support diverse recognition networks

- Provide multiple examples
- Highlight critical features
- Provide multiple media and formats
- Support background context



Effective Methods from a UDL Perspective

- Can be continually adjusted to meet learner needs
- Include all students within a collaborative environment



Recognition

MULTIPLE MEANS OF REPRESENTATION

This principle focuses on the ways in which learners gather facts and categorize what they see, hear, and read (CAST, 2011). Addressing variability in perception encourages engagement and supports comprehension.

Adjust the activity/task

Offer alternative forms of information such as diagrams, photographs, storyboards, and multimedia.

For content presented in digital text, allow for tools such as text-to-speech to minimize cognitive demands on decoding, especially for students with dyslexia and English language learners.

Support the learner to cope with challenges within the activity/task

Introduce information progressively with temporary assistive components or scaffolds to help students manage the content at a reasonable pace.

Pre-teach critical information and emphasize relationships between concepts through multiple representations.

Model ways to solve new problems with previously learned skills and guide generalization of student learning to new contexts by providing supported opportunities.

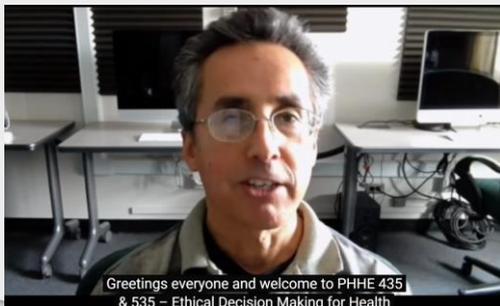


• Flexible Multimedia

- Text
- Images
- Audio
- Video
- Audio Description
- Captions
- Transcripts
- Web



Closed captioning



AUDIO

- From podcasts to music to videos, the impact of one or several voices can engage students in addition to the use of images and text.
- For **audio** to be meaningful, it is essential to provide support in other formats as well as to record and choose pieces that are clear and engaging for students.



Considerations

- **Audio should be of**
 - High quality sound
 - Allow for volume adjustment
 - Playback speed variation
 - Pausing
 - When recording audio, ensure a moderate, consistent pace and include pauses that make the audio more understandable



Considerations

- **Audio clips should be relatively short in duration**
- **Divided into short chapters or sections**
- **Provide alternate ways to convey audio content,**
 - Transcript
 - Image or graphic (w/ description)

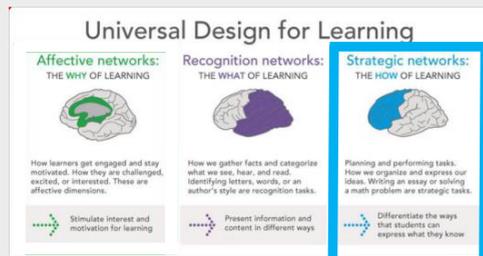


Multiple Means of Representation

- **Scenario**
- **Solution**
- **Delivering important lectures via podcasts**
- **Recorded in an environment with distracting background noise**
- **Records these podcasts the night before class or in her office while a janitor works nearby**



Strategic Networks



Considerations (CAST 2014)

- **Multiple Means of Action & Expression**
 - Vary the method of response in your assessments
 - Use web conferencing to broaden options for communication and expression of knowledge
 - Support executive functioning skills to help students set goals, manage time, organize, and apply strategies



Considerations

- Options for ways to work with the content
- Different ways for students to demonstrate what they are learning
- Tools to help students organize information?
- Is the assessment relevant?



Strategic

MULTIPLE MEANS OF ACTION AND EXPRESSION
This principle is connected to strategic actions, including planning and performing tasks, organizing and expressing ideas, writing essays, and solving math problems (CAST, 2011). Providing options for how students demonstrate comprehension helps sustain engagement and encourage persistence.

Adjust the activity/task Provide [access to assistive technologies](#) for expression. Adjust activity so that students can express their knowledge effectively and efficiently by including multiple tools for composition (e.g., written expression, voice recordings, modeling).

Support the learner to cope with challenges within the activity/task Support executive functioning by modeling goal-setting, selecting learning strategies, and monitoring progress. Use prompts to promote reflection about work and process. Guide students through sequences and prioritization. Model organization strategies and offer solutions to manage information.

To monitor progress, embed frequent formative and low-stakes assessments to collect actionable information to guide instructional decision-making. Give specific targeted and timely feedback about strengths and weaknesses that encourage student persistence and suggests next steps. Make clear that assessment informs instruction, as well.

Course Schedule

Date	Topic	Readings and activities (Additional readings are available on Blackboard)	Assignments - Due Dates
Module 1 August 25 - September 5	Understanding Action Research Qualitative vs Quantitative overview Mixed methods	Mills Chapter 1, McMillan Chapter 1 Mills Chapter 7 McMillan Chapter 2	Introduction Discussion Board 1) Initial post due Sunday, August 31 by 11:59 p.m. AND 2) Replies to at least 2 colleagues' introduction posts due Friday, September 5th by 11:59 p.m. Posting "Where You Are Assignment" due Sunday, September 7th by 11:59 p.m.
Module 1 September 7 - September 20	Literature Reviews Structurizr: Sources online (optional) Monday, September 8 th 9p.m. - 7 p.m.	Mills Chapter 3 McMillan Chapter 3	Literature Review Discussion Board 1) Initial post due Friday, September 12 by 11:59 p.m. AND 2) Replies to at least 2 colleagues' posts due Sunday, September 14th by 11:59 p.m.
Module 3 September 21 - October 4	Participans and Sampling Ethics Registration of research - IRB	McMillan Chapter 4 Mills Chapter 2; McMillan Chapter 1 (pp 17-19)	Literature Review Assignment due Sunday, September 21 st by 11:59 p.m. Ethics Discussion Board 1) Initial responses due by Friday, September 26th by 11:59 p.m. AND 2) Responses to at least 2 colleagues due by Sunday, September 28th by 11:59 p.m. Participans & Sampling assignment due Sunday, October 5th by 11:59 p.m.



Rubric

Criteria	Rubric for Sampling Plan		
	Needs Work	Developing	Meets Expectations
<p>Content</p> <p>1) (18 points) Responses are brief. Minimal problems with mechanics such as spelling and grammar errors, poor punctuation causing the readers confusion, and/or poor layout such as inconsistent font sizes, font colors, headings, and/or text alignment.</p> <p>2) Research Question</p> <p>3) Research Hypothesis</p> <p>4) Population</p> <p>5) Study Sample</p> <p>6) Age range</p> <p>7) Gender</p> <p>8) Other characteristics that may be applicable for your study</p> <p>9) Select the sampling method (and your rationale) for your study</p> <p>10) Explain how you will obtain the sample</p> <p>11) Explain population generalizability: explain</p> <p>12) Ecologic of generalizability: explain</p> <p>13) Strength & 3 weaknesses of the sampling method you have selected</p>	<p>1) (15 points) Responses demonstrate moderate level of critical thinking. Respects the views of peers by using academic and nonthreatening language. Brings forth new or expanded ideas that reflect moderate level critical thinking on the topic and demonstrate practical application. Connects with the course materials.</p> <p>2) Research Question</p> <p>3) Research Hypothesis</p> <p>4) Population</p> <p>5) Study Sample</p> <p>6) Age range</p> <p>7) Gender</p> <p>8) Other characteristics that may be applicable for your study</p> <p>9) Select the sampling method (and your rationale) for your study</p> <p>10) Explain how you will obtain the sample</p> <p>11) Explain population generalizability: explain</p> <p>12) Ecologic of generalizability: explain</p> <p>13) Strength & 3 weaknesses of the sampling method you have selected</p>	<p>1) (18 points) Responses demonstrate high level of critical thinking. Respects the views of peers by using academic and nonthreatening language. Brings forth new or expanded ideas that reflect high level critical thinking on the topic and demonstrates practical application. Connects with the course materials.</p> <p>2) Research Question</p> <p>3) Research Hypothesis</p> <p>4) Population</p> <p>5) Study Sample</p> <p>6) Age range</p> <p>7) Gender</p> <p>8) Other characteristics that may be applicable for your study</p> <p>9) Select the sampling method (and your rationale) for your study</p> <p>10) Explain how you will obtain the sample</p> <p>11) Explain population generalizability: explain</p> <p>12) Ecologic of generalizability: explain</p> <p>13) Strength & 3 weaknesses of the sampling method you have selected</p>	
<p>Form</p> <p>1) (18 points) Responses are brief. Minimal problems with mechanics such as spelling and grammar errors, poor punctuation causing the readers confusion, and/or poor layout such as inconsistent font sizes, font colors, headings, and/or text alignment.</p>	<p>1) (15 points) Responses are brief. Minimal problems with mechanics such as spelling and grammar errors, poor punctuation causing the readers confusion, and/or poor layout such as inconsistent font sizes, font colors, headings, and/or text alignment.</p>	<p>1) (18 points) Responses are succinct yet thorough. Standard English mechanics and grammar were used and presented in a logical format that is easy to follow.</p>	
Total Points			

Multiple Means of Action and Expression

- **Scenario**
- **Solution**
- Group of educators new to online course components
- Posting long lectures for students to listen to at their own leisure
- The lectures are each over twenty minutes in length with no pauses between sections.
- Many of these educators have a dry tone since they are not used to recording themselves.



References and Resources

- Center for Applied Special Technology (CAST)
 - www.cast.org
- National Center on Universal Design for Learning
 - www.udcenter.org



References/Resources

- [UDL On Campus](#)
- UDL Books
- Cast Publishing
- [Universal Design for Learning Guidelines](#)
- [UDL Guidelines: Theory & Practice Version](#)
- [Universal Design Learning Explained for Teachers](#)
- [Creating Color-Blind Accessible Figures](#)



Questions

