Universal Design for Learning: Multiple Means of Representation

Educator presents new learning to students through multiple types of medium by applying the Universal Design for Learning (UDL) Principle of Multiple Means of Representation.

Key Method

The educator delivers new learning through multiple types of medium to enable learners to perceive new information, understand various representations, and transfer new information into usable knowledge.

Method Components

Recognition Networks: Provide Multiple Means of Representation

Recognition Networks in the brain are responsible for receiving, analyzing, and forming concepts from information gathered through the senses. For this reason, the Recognition Networks are known as the "what" of learning. Educators who implement multiple means of representation into lesson design provide students with

- access to key vocabulary necessary to unlock the meaning of disciplinary content.
- control over the pace and process for accessing content.
- ways to understand abstract concepts and the relationships among ideas related to the content.
- smaller segments or chunks of content at one time.

The following guidelines provide a more in-depth understanding of the Recognition Networks.

Guideline 1: Provide Options for Perception

Perception refers to the way humans process sensory information and make interpretations about that information. It is important to note that perception is not the same as the sensation—seeing, hearing, feeling, tasting. A new mother might awaken to a tiny whimper from her baby in the night, but sleep through the sound of an ambulance. She hears both sounds, but she perceives the sound of her baby, not the sound of the ambulance. Likewise, students often interpret the same sensations differently or have different perceptions based on their current knowledge and past experiences. Many new technologies have alternatives that enhance auditory and visual displays that students can easily access. Educators can offer support for Guideline 1 by considering the following checkpoints and supporting questions.

- **Checkpoint 1.1: Offer ways of customizing the display of information.** Do I provide flexibility for students to adjust the way content is displayed (e.g., font size, colors, volume, graphics, contrast) and the speed or rate of delivery?
- **Checkpoint 1.2: Offer alternatives for auditory information.** Do I provide an alternative to auditory information, or must learners rely solely on sound?
- **Checkpoint 1.3: Offer alternatives for visual information.** Do I provide non-visual alternatives to images and printed text, or must learners rely solely on sight?

Guideline 2: Provide Options for Language, Mathematical Expressions, and Symbols

For students to build understanding from words, symbols, icons, and mathematical notations, they must first be able to unlock the meaning that each word or symbol conveys. They are then able to build on this knowledge and create meaning as they learn about sentence structures and mathematical formulas, as well as the meaning of figurative language and idioms. Educators support Guideline 2 by considering the following checkpoints and supporting questions.

- **Checkpoint 2.1: Clarify vocabulary and symbols.** Do I pre-teach unfamiliar vocabulary, symbols, or icons and embed alternate representations within the content to support students in new learning (e.g., footnotes, glossaries, illustrations)?
- **Checkpoint 2.2: Clarify syntax and structure.** Do I explicitly teach the relationship between words, a sentence, or a paragraph and notations in a formula or equation?
- **Checkpoint 2.3: Supporting decoding of text, mathematical notation, and symbols.** Do I provide students who struggle with decoding and automaticity with options to reduce barriers caused by a lack of fluency?
- **Checkpoint 2.4: Promote understanding across languages.** Do I promote understanding of formal English and academic language through tools and translations in the student's dominant language?
- **Checkpoint 2.5: Illustrate through multiple media.** Do I illustrate concepts and processes through multiple media (illustrations, simulations, images, interactive graphics) to make text more comprehensible?

Guideline 3: Provide Options for Comprehension

The goal of comprehension is for students to store new learning in their long-term memories so the information can be recalled and transferred to practical applications in the future. As students increase their comprehension of context, they transform

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information into usable knowledge. Educators support Guideline 3 by considering the following checkpoints and supporting questions.

- **Checkpoint 3.1: Activate or supply background knowledge.** Do I relate new content to students' existing background knowledge and experiences?
- **Checkpoint 3.2: Highlight patterns, critical features, big ideas, and relationships.** Do I relate patterns, critical features, and big ideas in new content to help students connect with what they already know?
- **Checkpoint 3.3: Guide information processing, visualization, and manipulation.** Do I prompt and support students as they acquire understanding through information processing, visualization, and manipulation of materials?
- **Checkpoint 3.4: Maximize transfer and generalization.** Do I help students organize information in ways that maximize transfer of content and generalization of concepts?

Supporting Rationale and Research

The Supporting Rationale and Research includes resources for learning more about UDL Multiple Means of Representation. As you interact with these learning materials, take time to reflect on your professional practice.

Research

CAST. (2018). Universal Design for Learning Guidelines (version 2.2). Retrieved from http://udlguidelines.cast.org.

Rao, K., & Meo, G. (2016). *Using Universal Design for Learning to Design Standards-Based Lessons*. SAGE Open. https://bit.ly/3BHvVyG

Strangman, N., Vie, G., Hall, T., & Meyer, A. (2004). *Graphic Organizers and Implications for Universal Design for Learning: Curriculum Enhancement Report*. Wakefield, MA: National Center on Accessing the General Curriculum. https://bit.ly/3vEmpZw

Resources

UDLA How to Read the UDL Guidelines. This video explains the Universal Design for Learning Networks, Guidelines, and Principles and includes connections to the classroom.

UDL Guideline #2: Provide Multiple Means of Representation. This resource, created by UNC Greensboro, includes many examples for providing multiple means of representation in various instructional settings.

UDL Representation Progression Rubric. This rubric provides suggested criteria for successfully implementing the UDL Principle of Representation. The full UDL Progression Rubric can be accessed here.

UDLA Representation Video Series. The Universal Design for Learning Academy developed a series of videos for educators focused on the UDL Principle of Representation: Provide Options for Perception, Provide Options for Language and Symbols, and Provide Options for Comprehension.

Harnessing the Power of UDL. The Providing Options for Language and Symbols padlet and the Providing Options for Comprehension padlet provide you with access to various resources and allow you to engage in self-guided learning.

Guide to Universal Design for Learning: Provide Multiple Means of Representation. This website, developed by New Zealand's Inclusive Education website, provides an overview and strategies for implementing the principle of multiple means of representation.

The Science of Drawing and Memory. This resource explains how to use drawing as a powerful tool to boost student learning and how it challenges students to explore an idea in different ways.

UDL for Teachers: Representation. This website provides videos and includes suggested strategies for implementing the three UDL guidelines aligned with the Principle of Providing Multiple Means of Representation.

UDL-Aligned Strategies. This website provides instructional methods and tools used by education professionals to ensure that all students have an equal opportunity to learn. The strategies are aligned with the networks and guidelines of UDL.

Removing the Barriers: Planning for ALL! This video talks about a paradigm shift in mindset and the importance of context when planning for all students.

Assistive Technology Resource Guide for Arkansas Schools. Assistive technology is used to increase or improve the independence of a student with a disability in education. This guide places an increased focus on assistive technology and the application to a Universal Design for Learning Framework.

Arkansas Division of Elementary and Secondary Education: Accessible Educational Materials. This website is designed to provide information about accessible educational materials, including available resources and services, to Arkansas educators, parents, and students.

National Center on Accessible Educational Materials. The National Center on Accessible Educational Materials for Learning website at CAST provides technical

assistance, coaching, and resources to increase the availability and use of accessible educational materials and technologies for learners with disabilities across the lifespan.

Submission Guidelines and Evaluation Criteria

This section is divided into three areas: Overview, Artifacts and Evidence, and Reflection. To earn this micro-credential, you must receive "Passing" on Parts One and Three, and "Yes" on all criteria in Part Two.

Part One. Overview

Read the Overview criteria carefully to ensure a thorough understanding of the expectations for a "passing" submission.

Prompt: Use the UDL Progression Rubric to self-assess your current implementation of Multiple Means of Representation. Submit the completed UDL Progression Rubric self-assessment as one of your artifacts.

In addition, provide a written response in which you describe challenges or barriers your students experience when perceiving and comprehending information. In your response include:

- Student demographics (e.g., socioeconomic status, English learners, students eligible to receive special education, IEPs, and/or 504 plans)
- Content area and grade level(s)
- Your primary method for delivery of content (i.e., explain how you typically present students with academic content)

This submission is scored either "passing" or "not passing."

Passing: *Earner submits a completed UDL Progression Rubric self-assessment and includes a written response to each part of the prompt; total written response should be at least 250-words and provide adequate detail to help the scorer understand the context for your submission.*

Part Two. Artifacts and Evidence

Read the Artifacts and Evidence Submission requirements carefully to ensure a thorough understanding of the expectations for a "Yes" on each task.

Task 1: Options for Perception

Modify an upcoming lesson to incorporate the UDL Guideline 1: Providing Options for Perception. Incorporate the Checkpoints 1.1, 1.2, and 1.3 into the lesson design and

implement with students. In a written response, explain how you modified the lesson to incorporate the Checkpoints and describe how these changes impacted students' ability to access and perceive information.

In addition to your written response, upload artifacts that demonstrate implementation of Checkpoints 1.1, 1.2, and 1.3. Artifacts may include photos and/or video/audio recordings that highlight the checkpoints in the lesson design and the before and after of student interfacing materials.

Please submit the written response (at least 250-words) and artifacts with the titles "Task 1 Written Response" and "Task 1 Artifacts of Implementation" as evidence for Task 1.

Task 2: Options for Language and Symbols

If teaching a course with text, select a chunk of text for an upcoming lesson and identify the related vocabulary and concepts. Upload as Artifact 1 for this task.

If teaching a course without text, select an upcoming lesson and identify the related vocabulary, symbols, equations, notations, and concepts. Upload as Artifact 1 for this task.

Based on the text or concept, create a lesson design that incorporates a minimum of three Checkpoints (2.1, 2.2, 2.3, 2.4, and/or 2.5) for Guideline 2: Provide Options for Language, Mathematical Expressions, and Symbols. In a written response or audio recording, explain how the selected checkpoints provide students with access to the content and provide meaning for unfamiliar words, symbols, syntax, equations, notations, or concepts.

In addition to your written response, upload artifacts that demonstrate implementation of the selected Checkpoints. Artifacts may include, but are not limited to, slide deck presentations, visuals, video/audio technology, or graphic organizers/concept maps that students have completed.

Please submit the text or concept, the written response (250-word minimum) or audio recording, and artifacts with the titles "Task 2 Text or Concept", "Task 2 Written Response or Audio Recording", and "Task 2 Artifacts of implementation" as evidence for Task 2.

Task 3: Options for Comprehension

Submit a video of you engaging students in new learning that incorporates Guideline 3: Provide Options for Comprehension and the four Checkpoints (3.1, 3.2, 3.3, and 3.4). The video should clearly capture the implementation of each Checkpoint.

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In addition, provide a written or recorded commentary that thoroughly explains how you addressed the four Checkpoints and how your delivery enabled all learners to better comprehend the information and form relationships between new and prior knowledge.

Please submit the video of engaging students and the commentary with the titles "Task 3 Engaging Students Video" and "Task 3 Commentary" as evidence for Task 3.

Artifacts and Evidence Scoring Guide

Tasks	Not Yet	Almost	Yes
Task 1: Options for Perception	The earner does not submit a written response as required for Task 1. **OR** The earner does not submit artifacts or student interfacing materials as required for Task 1.	The earner submits a written response that partially • explains how the lesson was modified to incorporate checkpoints 1.1, 1.2, and 1.3 • describes how the changes impacted students' ability to access and perceive information **AND** The earner submits artifacts that partially demonstrate implementation of the checkpoints 1.1, 1.2, and 1.3 in the lesson design and submits some of the before and after of student interfacing materials.	The earner submits a written response (at least 250-words) that thoroughly • explains how the lesson was modified to incorporate checkpoints 1.1, 1.2, and 1.3 • describes how the changes impacted students' ability to access and perceive information **AND** The earner submits artifacts that demonstrate implementation of checkpoints 1.1, 1.2, and 1.3 in the lesson design and submits the before and after of student interfacing materials.
Task 2: Options for Language and Symbols	The earner does not submit the text or the lesson as required for Task 2. **OR** The earner does not submit a written response or audio recording as required for Task 2. **OR** The earner does not submit artifacts that demonstrate the implementation of the selected checkpoints as required for Task 2.	The earner submits the text with the identified vocabulary and concepts, or earner submits the lesson with the related vocabulary, symbols, equations, notations, and concepts. **AND** The earner submits a written response or audio recording that thoroughly explains the intentional integration of less than three checkpoints or partially explains the intentional integration of three checkpoints from Guideline 2 into a lesson design to support student access to learning. **AND** The earner submits artifacts that somewhat demonstrate the implementation of the selected checkpoints.	The earner submits the text with identified vocabulary and concepts, or earner submits the lesson with related vocabulary, symbols, equations, notations, and concepts. **AND** The earner submits a written response (at least 250-words) or audio recording that thoroughly explains the intentional integration of at least three checkpoints from Guideline 2 into a lesson design to support student access to learning. **AND** The earner submits artifacts that clearly demonstrate the implementation of the selected checkpoints.

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Task 3: Options for Comprehension	The earner does not submit a video that demonstrates the implementation of the checkpoints for Comprehension and students engaged in new learning as required for Task 3. **OR** The earner does not submit written or audio commentary as required for Task 3.	The earner submits a video that partially demonstrates the implementation of the checkpoints for Comprehension and students engaged in new learning. **AND** The earner submits written or audio commentary that partially explains how the four checkpoints are used to impact comprehension and support students in forming relationships between new and prior knowledge.	The earner submits a video that thoroughly demonstrates the implementation of the four checkpoints for Comprehension and students engaged in new learning. **AND** The earner submits written or audio commentary that thoroughly explains how the four checkpoints are used to impact comprehension and support students in forming relationships between new and prior knowledge.

Part Three. Reflection

Read the Reflection guidelines and evaluation criteria carefully to ensure a thorough understanding of the expectations for a "passing" submission.

Prompt: Submit a response to the following prompts:

- Reflect on and explain the ways that implementation of UDL: Multiple Means of Representation enable learners to perceive new information, understand various representations, and transform new learning into usable knowledge.
- Use the UDL Progression Rubric to reflect on and self-assess your implementation of Multiple Means of Representation. Submit the completed UDL Progression Rubric self-assessment and provide specific evidence to support each Checkpoint rating.

This submission is scored either "passing" or "not passing."

Passing: *Earner submits a completed UDL Progression Rubric self-assessment and includes a response to each part of the prompt; total written response should be at least 250-words. Responses should clarify and further explain how earning this micro-credential has impacted your professional practice and student outcomes.*

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