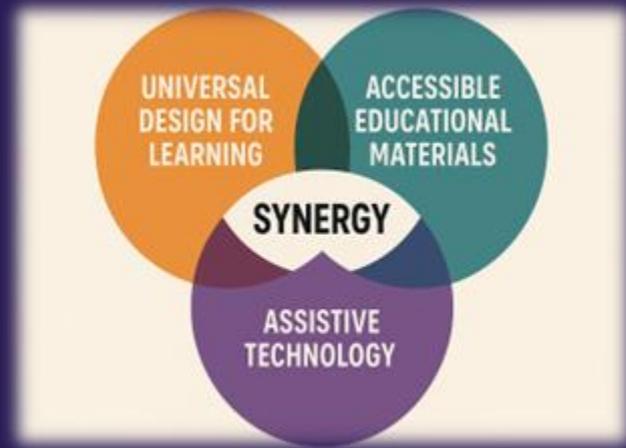




# The Synergies

UDL, AEM and AT



Date: 06/26/2025

Slides: [bit.ly/INDATAandCAST](https://bit.ly/INDATAandCAST)

# Presenter



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[LinkedIn](#)

[X](#)

# About CAST

A nonprofit education research and development organization that created the [Universal Design for Learning](#) framework and [UDL Guidelines](#), now used all over the world to make learning more inclusive.



**CAST**  
Until  
learning  
has no  
limits'

# Our Accessibility Commitment

## Perceivable

- Alt text on images
- High color contrast
- Readable font
- Video with closed captions
- Video with audio description

## Operable

- Distinct slide titles
- Shortened links with descriptive back-halves

## Understandable

- Clear structure and layout
- Consistent formatting
- Effective use of images

## Robust

- Checked for accessibility using both the accessibility checker and a manual test by a user of assistive technology

# Session Goals

- Describe two different examples of how AEM, AT, and accessible technology work together.
- Discuss one or more ways AEM, AT, and accessible technology are being utilized in their current environment.
- Identify three resources to support continuous learning around AEM, AT, and accessible technology.

# Check-In

On a scale of Cat, how are feeling today ?



# Universal Design for Learning

Designing for Every Learner

# Definition of UDL

**Universal Design for Learning (UDL)** is an approach to improve and optimize teaching and learning for *all* by setting clear, **rigorous goals; anticipating barriers; and proactively designing** to minimize those barriers.



# Goal of UDL

Learning is a survival skill in the world. Educators can use UDL to design learning that honors and builds the agency of students to make learning decisions.



# Universal Design for Learning (UDL)

- Barrier is in the design
- Learner Variability

**The Universal Design for Learning Guidelines**

The goal of UDL is learner agency that is purposeful & reflective, resourceful & authentic, strategic & action-oriented.

	<b>Design Multiple Means of Engagement</b>	<b>Design Multiple Means of Representation</b>	<b>Design Multiple Means of Action &amp; Expression</b>
<b>Attract</b>	<b>Design Options for Welcoming Interests &amp; Identities</b> <ul style="list-style-type: none"><li>• Optimize choice and autonomy</li><li>• Optimize relevance, value, and authenticity</li><li>• Nurture joy and play</li><li>• Address biases, threats, and distractions</li></ul>	<b>Design Options for Perception</b> <ul style="list-style-type: none"><li>• Support opportunities to customize the display of information</li><li>• Support multiple ways to perceive information</li><li>• Represent a diversity of perspectives and identities in authentic ways</li></ul>	<b>Design Options for Interaction</b> <ul style="list-style-type: none"><li>• Vary and honor the methods for response, navigation, and movement</li><li>• Optimize access to accessible materials and assistive and accessible technologies and tools</li></ul>
<b>Support</b>	<b>Design Options for Sustaining Effort &amp; Persistence</b> <ul style="list-style-type: none"><li>• Clarify the meaning and purpose of goals</li><li>• Optimize challenge and support</li><li>• Foster collaboration, interdependence, and collective learning</li><li>• Foster belonging and community</li><li>• Offer action-oriented feedback</li></ul>	<b>Design Options for Language &amp; Symbols</b> <ul style="list-style-type: none"><li>• Clarify vocabulary, symbols, and language structures</li><li>• Support decoding of text, mathematical notation, and symbols</li><li>• Cultivate understanding and respect across languages and dialects</li><li>• Address biases in the use of language and symbols</li><li>• Illustrate through multiple media</li></ul>	<b>Design Options for Expression &amp; Communication</b> <ul style="list-style-type: none"><li>• Use multiple media for communication</li><li>• Use multiple tools for construction, composition, and creativity</li><li>• Build fluency with graduated support for practice and performance</li><li>• Address biases related to modes of expression and communication</li></ul>
<b>Empower</b>	<b>Design Options for Emotional Capacity</b> <ul style="list-style-type: none"><li>• Recognize expectations, beliefs, and motivations</li><li>• Develop awareness of self and others</li><li>• Promote individual and collective reflection</li><li>• Cultivate empathy and restorative practices</li></ul>	<b>Design Options for Building Knowledge</b> <ul style="list-style-type: none"><li>• Connect prior knowledge to new learning</li><li>• Highlight and explore patterns, critical features, big ideas, and relationships</li><li>• Cultivate multiple ways of knowing and making meaning</li><li>• Maximize transfer and generalization</li></ul>	<b>Design Options for Strategy Development</b> <ul style="list-style-type: none"><li>• Set meaningful goals</li><li>• Anticipate and plan for challenges</li><li>• Organize information and resources</li><li>• Enhance capacity for monitoring progress</li><li>• Challenge exclusionary practices</li></ul>

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# Design Multiple Means of Engagement

## Design Options for:

- Welcoming Interests and Identities
- Sustaining Effort and Persistence
- Emotional Capacity

**Design Multiple Means of Engagement** 

**Design Options for Welcoming Interests & Identities**

- Optimize choice and autonomy
- Optimize relevance, value, and authenticity
- Nurture joy and play
- Address biases, threats, and distractions

**Design Options for Sustaining Effort & Persistence**

- Clarify the meaning and purpose of goals
- Optimize challenge and support
- Foster collaboration, interdependence, and collective learning
- Foster belonging and community
- Offer action-oriented feedback

**Design Options for Emotional Capacity**

- Recognize expectations, beliefs, and motivations
- Develop awareness of self and others
- Promote individual and collective reflection
- Cultivate empathy and restorative practices

# Design Multiple Means of Representation

## Design Options for:

- Perception
- Language & Symbols
- Building Knowledge

The infographic is a vertical stack of three light purple rounded rectangles. The top rectangle has a dark purple header with the title 'Design Multiple Means of Representation' and a brain icon. The middle rectangle is titled 'Design Options for Perception' and lists three bullet points. The bottom rectangle is titled 'Design Options for Building Knowledge' and lists three bullet points.

**Design Multiple Means of Representation**

**Design Options for Perception**

- Support opportunities to customize the display of information
- Support multiple ways to perceive information
- Represent a diversity of perspectives and identities in authentic ways

**Design Options for Language & Symbols**

- Clarify vocabulary, symbols, and language structures
- Support decoding of text, mathematical notation, and symbols
- Cultivate understanding and respect across languages and dialects
- Address biases in the use of language and symbols
- Illustrate through multiple media

**Design Options for Building Knowledge**

- Connect prior knowledge to new learning
- Highlight and explore patterns, critical features, big ideas, and relationships
- Cultivate multiple ways of knowing and making meaning
- Maximize transfer and generalization

# Design Multiple Means of Action & Expression

## Design Options for:

- Interaction
- Expression & Communication
- Strategy Development

**Design Multiple Means of Action & Expression** 

**Design Options for Interaction**

- Vary and honor the methods for response, navigation, and movement
- Optimize access to accessible materials and assistive and accessible technologies and tools

**Design Options for Expression & Communication**

- Use multiple media for communication
- Use multiple tools for construction, composition, and creativity
- Build fluencies with graduated support for practice and performance
- Address biases related to modes of expression and communication

**Design Options for Strategy Development**

- Set meaningful goals
- Anticipate and plan for challenges
- Organize information and resources
- Enhance capacity for monitoring progress
- Challenge exclusionary practices

# Access, Support & Executive Function

- **Access** to the learning experience
- **Support** in the learning process
- **Executive function** choices and structures



**The Universal Design for Learning Guidelines**

The goal of UDL is learner agency that is purposeful & reflective, resourceful & authentic, strategic & action-oriented.

	<b>Design Multiple Means of Engagement</b>	<b>Design Multiple Means of Representation</b>	<b>Design Multiple Means of Action &amp; Expression</b>
Access	<b>Design Options for Welcoming Interests &amp; Identities</b> <ul style="list-style-type: none"><li>Optimize choice and autonomy</li><li>Optimize relevance, value, and authenticity</li><li>Nurture joy and play</li><li>Address biases, threats, and distractions</li></ul>	<b>Design Options for Perception</b> <ul style="list-style-type: none"><li>Support opportunities to customize the display of information</li><li>Support multiple ways to perceive information</li><li>Represent a diversity of perspectives and identities in authentic ways</li></ul>	<b>Design Options for Interaction</b> <ul style="list-style-type: none"><li>Vary and honor the methods for response, navigation, and movement</li><li>Optimize access to accessible materials and assistive and accessible technologies and tools</li></ul>
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Executive Function	<b>Design Options for Emotional Capacity</b> <ul style="list-style-type: none"><li>Recognize expectations, beliefs, and motivations</li><li>Develop awareness of self and others</li><li>Promote individual and collective reflection</li><li>Cultivate empathy and restorative practices</li></ul>	<b>Design Options for Building Knowledge</b> <ul style="list-style-type: none"><li>Connect prior knowledge to new learning</li><li>Highlight and explore patterns, critical features, big ideas, and relationships</li><li>Cultivate multiple ways of knowing and making meaning</li><li>Maximize transfer and generalization</li></ul>	<b>Design Options for Strategy Development</b> <ul style="list-style-type: none"><li>Set meaningful goals</li><li>Anticipate and plan for challenges</li><li>Organize information and resources</li><li>Enhance capacity for monitoring progress</li><li>Challenge exclusionary practices</li></ul>

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**"If you u design it together,  
they will thrive."**

**#BetterTogether**



**#UDL**

# UDL and Accessibility

# What does accessibility mean to you?



# Defining Accessibility

**A person with a disability can...**

**acquire** the same information  
**engage** in the same interactions  
**enjoy** the same services

in an equally effective,  
equally integrated manner,  
with substantially  
equivalent ease of use

**...as a person without a disability.**

# It Expands Beyond Disability

A person experiencing a barrier or challenge can...

**acquire** the same information

**engage/participate** in the same interactions

**enjoy** the same services

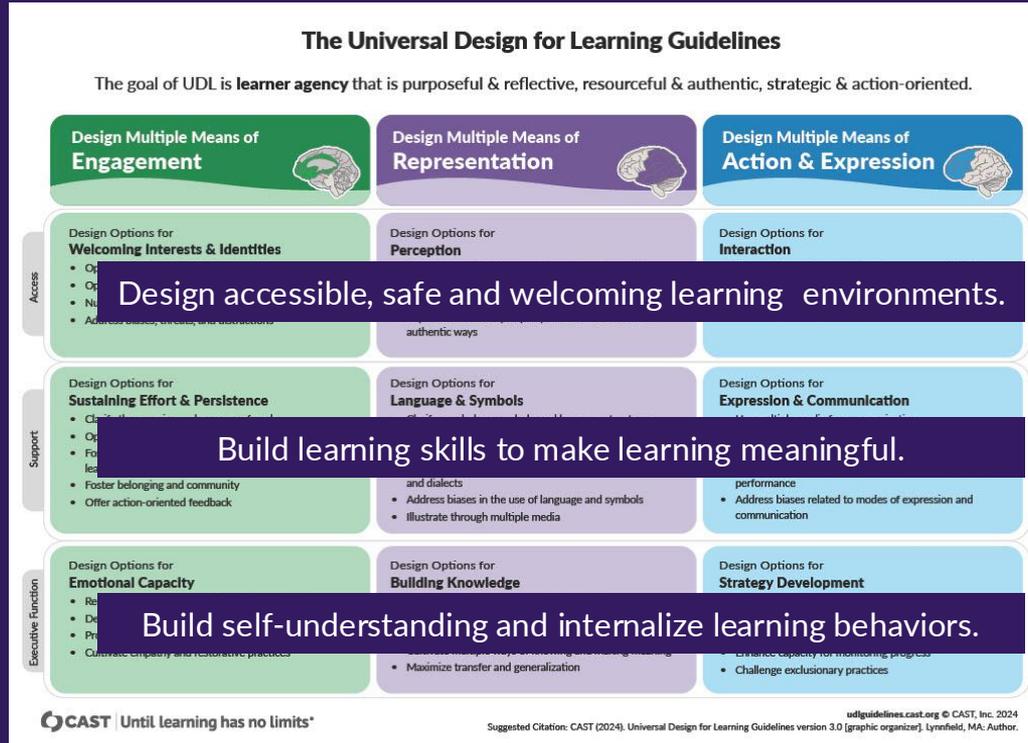
**equally effective:** the service or product works just as well for everyone

**equally integrated:** Everyone can use the service/product in the way that is meaningful to them without being singled out

**substantially equivalent ease of use:** It should be as easy for everyone to use, without requiring extra effort or difficulty

As a person not experiencing a barrier or challenge.

# Accessibility and UDL Guidelines



- [Long description of this image available.](#)

# Accessibility and UDL Guidelines 3.0

**Design Multiple Means of Action & Expression** 

Design Options for **Interaction**

- Vary and honor the methods for response, navigation, and movement
- Optimize access to accessible materials and assistive and accessible technologies and tools

Design Options for **Expression & Communication**

- Use multiple media for communication
- Use multiple tools for construction, composition, and creativity
- Build fluencies with graduated support for practice and performance
- Address biases related to modes of expression and communication

Design Options for **Strategy Development**

- Set meaningful goals
- Anticipate and plan for challenges
- Organize information and resources
- Enhance capacity for monitoring progress
- Challenge exclusionary practices

# Why do AT, AEM and Accessible Technologies Need to Work Together?

# First and Foremost

Contrary to common  
assumption...

**Digital does not  
mean accessible.**

# "I wish I had a label."

Some disabilities look like this



Some look like this



# What are AT, AEM and Accessible Technologies?

# Accessible Educational Materials (AEM)

**Accessible educational materials (AEM)** are print- and technology-based educational materials, including printed and electronic textbooks and related core materials that are designed or enhanced in a way that makes them:

- **usable across the widest range of learner variability, regardless of format (e.g., print, digital, graphic, audio, video).**

# Assistive Technology (AT)

- AT Defined in IDEA

“...any item, piece of equipment, or product whether acquired commercially, modified, or customized that is used to increase, maintain, or improve functional capabilities of a child with disabilities.”

# Connecting Accessibility and AT

- **Accessible materials, technologies and strategies** look to make the learning environment as flexible and accommodating as possible.
- **AT** looks to lower the specific barriers an individual student may face in whatever environment they find themselves.
- **Both** approaches strive to insure the access, participation & progress of students.

# Accessible & Assistive Technologies

Accessible	Assistive
Good for all	Individualized for one
About choice	About need
Offers flexibility for all	Improves functional capability of one
Is selected for its array of built-in universal features for all	Is selected based on features needed by an individual
Proactive	Responsive

# How do AEM, AT and Accessible Technologies Work Together?

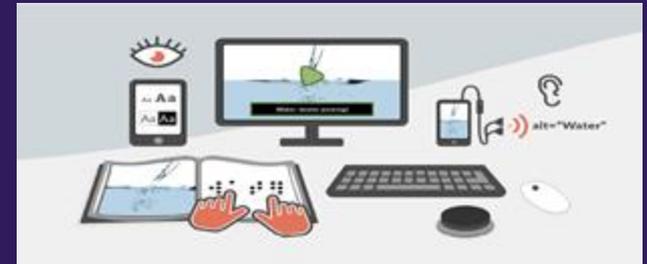
# Components of Access

## Universal Design for Learning

- Choice designed into the environment

## Accessible Educational Materials

- Same content, accessible format



## Accessible & Assistive Technologies

- Differing way to accessing, interacting, responding to same content

# When AEM Works

## Materials

Information or content of the curriculum.



## Technology

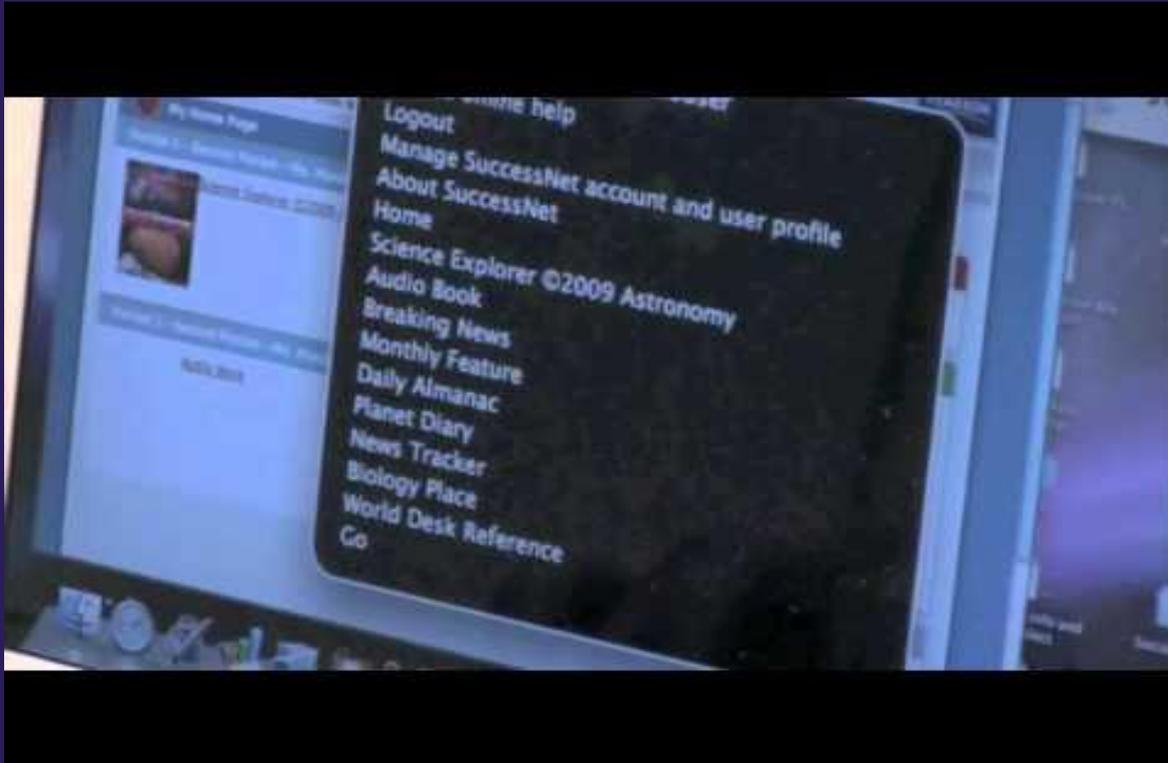
Hardware or software that delivers the material to learners.

Technology is accessible when **directly usable without AT** or **made usable with AT**.

## Assistive Technology (AT)

Hardware or software used by students with disabilities that is matched to their functional needs (e.g., physical, sensory, learning).

# Tyler's Science Book



# How Accessibility Works for Tyler

## Material

Digital science book



## Technology

iBook (laptop) and  
digital book platform

## Assistive Technology (AT)

VoiceOver screen reader

# Access Content from Start to Finish



# All Materials & Tech *Can Be* Accessible

- Laptops
- Tablets
- Smartphones
- Websites
- Documents



- Slide decks
- Videos
- Apps
- Digital textbooks
- Podcasts
- Learning Management Systems (LMSs)

# Let's Circle Back...

Accessibility leads to the opportunity for all students to use

- the **same** materials (content),
- the **same** technologies (**with or without AT**)
- at the **same** time,
- with substantially equal **ease of use**.

# Check for Barriers

- Get to.
- Get through.
- Get out.



Accessibility is everyone's responsibility.



# Tips for Accessible Educational Materials

## Tips for AEM

(how-to resource sheet)

Source: CAST

## Tips for Accessible Educational Materials

### 1. Don't assume digital means accessible.

**We used to think** that if an educational material was digital it was automatically accessible.

**We now know** that digital content is not inherently accessible so we provide learners with customizable digital content - content they can personalize. **And we are noticing** that many learners (not just those with disabilities) are more engaged, have improved fluency and skills, and better comprehension when using content they can make their own.

#### Learn How

- [Personalize the Reading Experience](#)
- [Personalize the Writing Experience](#)
- [Teaching with Accessible Math](#)
- [Teaching with Accessible Video](#)

### 2. Add "alt text" to images.

**We used to think** text was the only barrier in our curricular materials. **We now know** that images can create a barrier for learners who use screen readers, if an alternative means for perceiving the information in an image is not provided. **And we are noticing** that adding alternative ("alt") text (e.g., "photograph of a moose crossing a road") reduces this barrier and can help all learners better understand the relationships represented in the images.

#### Learn How

[Adding Alternative Text to Images](#)

### 3. Add closed captions to videos.

**We used to think** all learners could learn from videos. **We now know** that audio without accompanying text may create a barrier for learners who are deaf, hard of hearing or who are emerging bilingual learners so we add closed captions to video content. **And we are noticing** that lots of learners are using those captions for lots of reasons (e.g. viewing the video in a quiet setting, comprehension support).

#### Learn How

[Creating Accessible Video](#)

# Thank you!



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[Bluesky](#)

[LinkedIn](#)

[X](#)

# Multimedia Resources

## Podcast:

### The Learning Experience powered by CAST

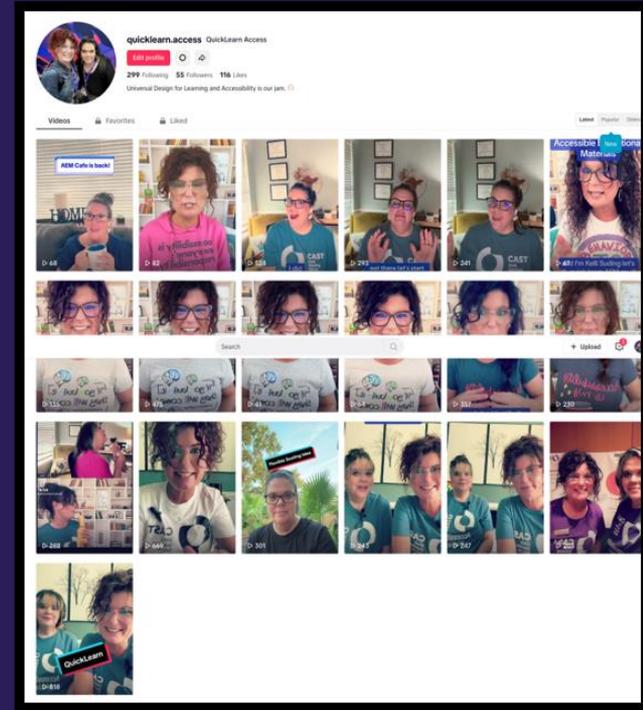
- Available on all major podcast platforms as well as on CAST's accessible player with interactive transcript



# Quick Learns

Bite-sized videos (1-2.5 minutes)

- [TikTok](#)
- [Instagram](#)
- LinkedIn: [Kelli](#) & [Michelle](#)
- X: [Kelli](#) & [Michelle](#)
- [Facebook](#)
- Bluesky: [Kelli](#) & [Michelle](#)
- [YouTube](#)



Save the Date



# UDL-CON: *International*

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Capital Hilton |  
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