

Universal Design for Learning & Accessibility in K-12 Education: Designing Learning to Serve All Students

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The Idea of Universal Design for Learning



Bad Design



Bad Design



Universal Design



But what is Universal Design for Learning?

Universal Design for Learning is ...

A research-based framework
for designing learning technologies
for everyone.

Provide Multiple
Means of
Engagement

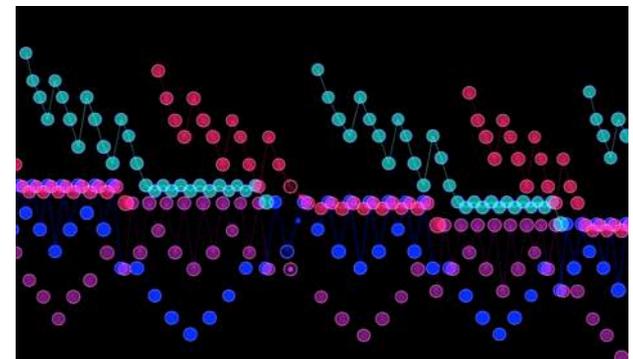
- Recruiting interest
- Sustaining effort & persistence
- Self-regulation

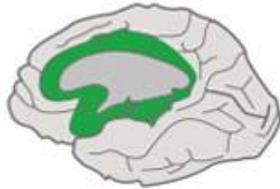
Provide Multiple
Means of
Representation

- Perception
- Language, expressions & symbols
- Comprehension

Provide Multiple
Means of Action
& Expression

- Physical action
- Expression & communication
- Executive function





Provide Multiple Means of Engagement

Purposeful, motivated learners

Provide options for self-regulation

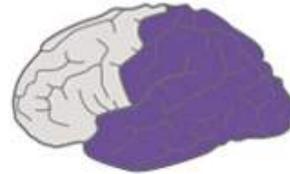
- + Promote expectations and beliefs that optimize motivation
- + Facilitate personal coping skills and strategies
- + Develop self-assessment and reaction

Provide options for sustaining effort and 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 recruiting interest

- + Optimize individual choice and autonomy
- + Optimize relevance, value, and authenticity
- + Minimize threats and distractions



Provide Multiple Means of Representation

Resourceful, knowledgeable learners

Provide options for comprehension

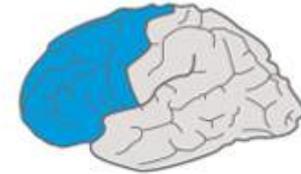
- + Activate or supply background knowledge
- + Highlight patterns, critical features, big ideas, and relationships
- + Guide information processing, visualization, and manipulation
- + Maximize transfer and generalization

Provide options for language, mathematical expressions, and symbols

- + 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 perception

- + Offer ways of customizing the display of information
- + Offer alternatives for auditory information
- + Offer alternatives for visual information



Provide Multiple Means of Action & Expression

Strategic, goal-directed learners

Provide options for executive functions

- + Guide appropriate goal-setting
- + Support planning and strategy development
- + Enhance capacity for monitoring progress

Provide options for expression and communication

- + Use multiple media for communication
- + Use multiple tools for construction and composition
- + Build uencies with graduated levels of support for practice and performance

Provide options for physical action

- + Vary the methods for response and navigation
- + Optimize access to tools and assistive technologies

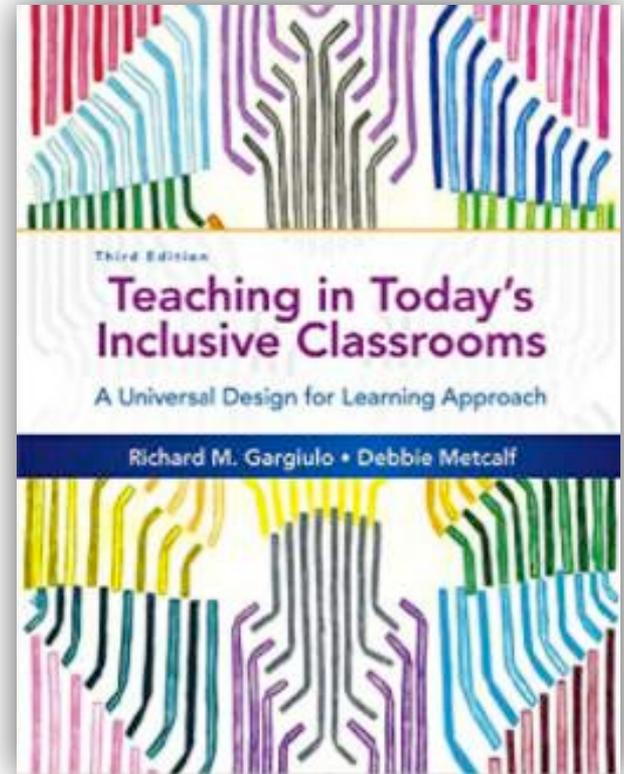


How **important** is Universal Design for Learning?

UDL Everywhere ...



UDL Everywhere ...



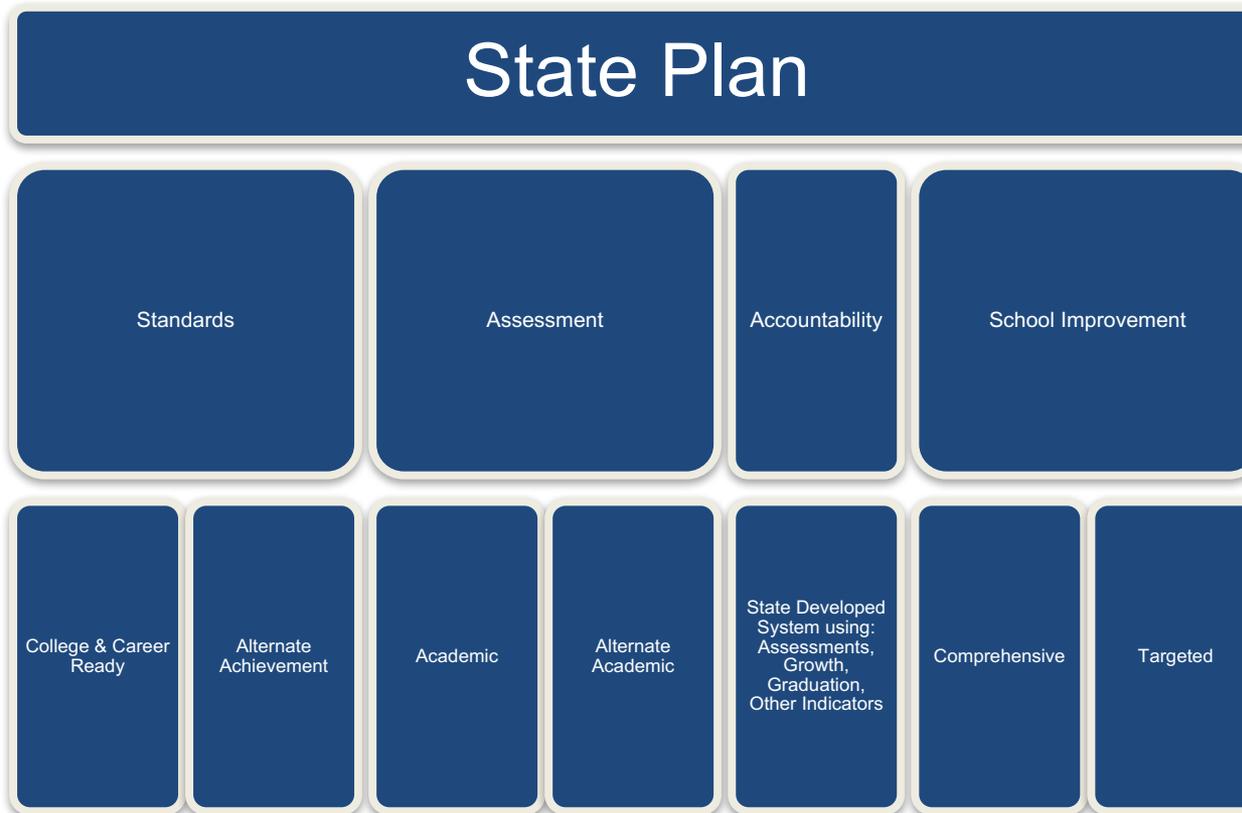
Education textbooks

UDL Everywhere ...



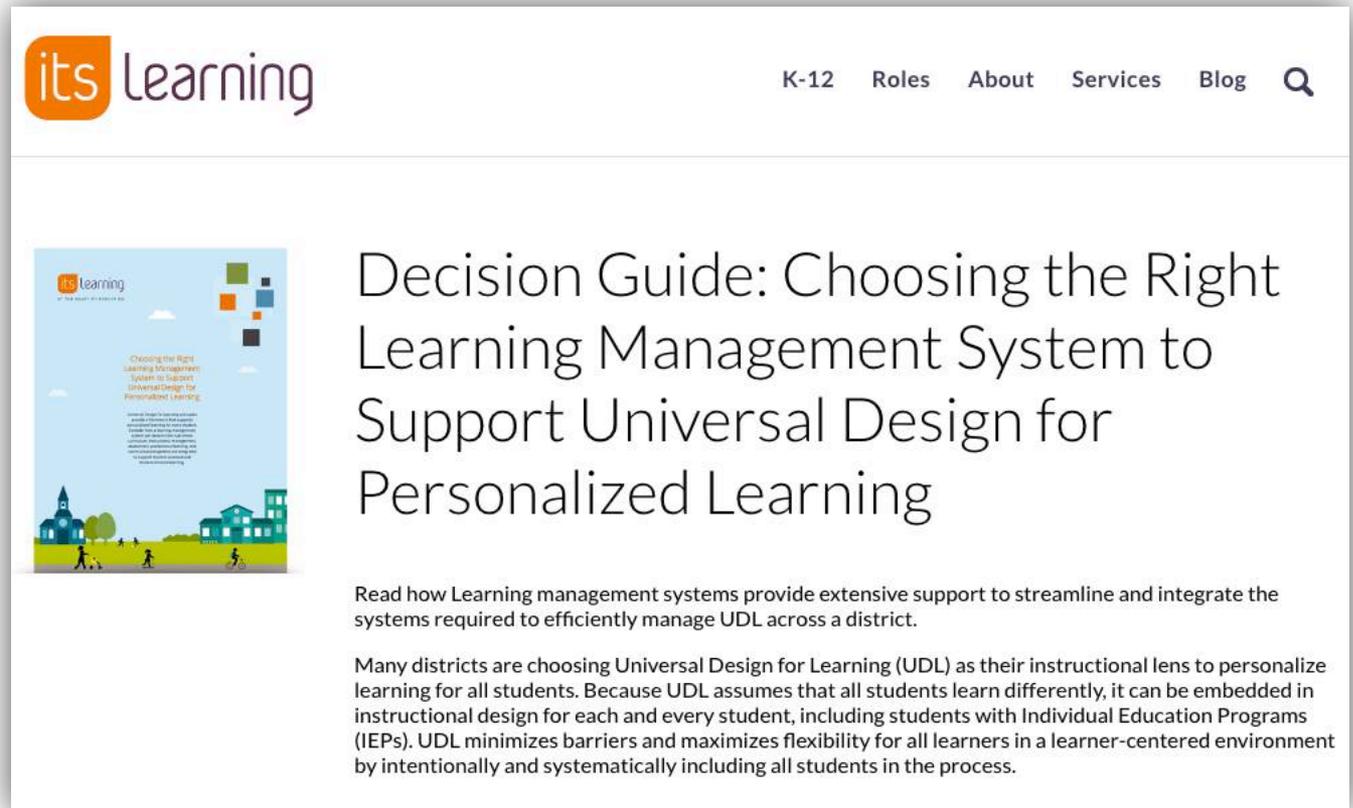
Council for Exceptional Children 2017
Conference & Expo: 35 UDL talks

UDL Everywhere ...



Title I, Part A: State Plans 2017

UDL Everywhere ...



The screenshot shows the ITS Learning website. The header includes the ITS Learning logo, navigation links for K-12, Roles, About, Services, and Blog, and a search icon. The main content area features a large article titled "Decision Guide: Choosing the Right Learning Management System to Support Universal Design for Personalized Learning". To the left of the article is a thumbnail image of the guide's cover, which includes the ITS Learning logo, the title, and a colorful illustration of a school building and people. The article text discusses how Learning Management Systems (LMS) provide extensive support to streamline and integrate the systems required to efficiently manage UDL across a district. It also notes that many districts are choosing UDL as their instructional lens to personalize learning for all students, and that UDL minimizes barriers and maximizes flexibility for all learners in a learner-centered environment by intentionally and systematically including all students in the process.

its learning

K-12 Roles About Services Blog

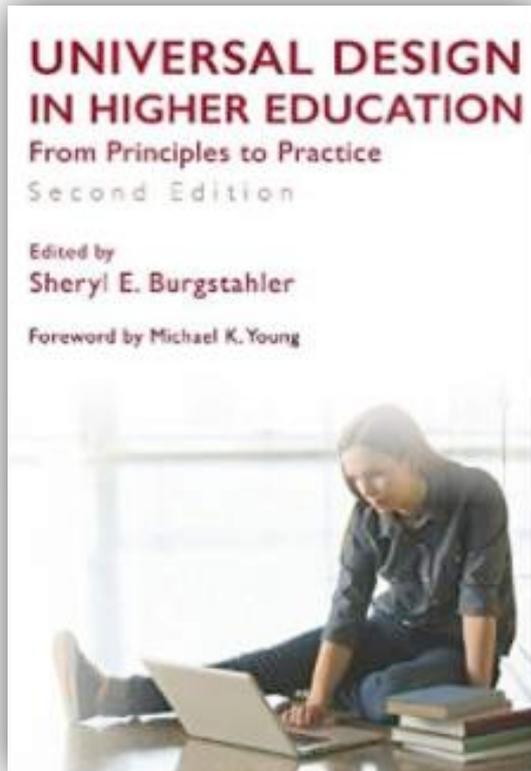
Decision Guide: Choosing the Right Learning Management System to Support Universal Design for Personalized Learning

Read how Learning management systems provide extensive support to streamline and integrate the systems required to efficiently manage UDL across a district.

Many districts are choosing Universal Design for Learning (UDL) as their instructional lens to personalize learning for all students. Because UDL assumes that all students learn differently, it can be embedded in instructional design for each and every student, including students with Individual Education Programs (IEPs). UDL minimizes barriers and maximizes flexibility for all learners in a learner-centered environment by intentionally and systematically including all students in the process.

EdTech Platforms

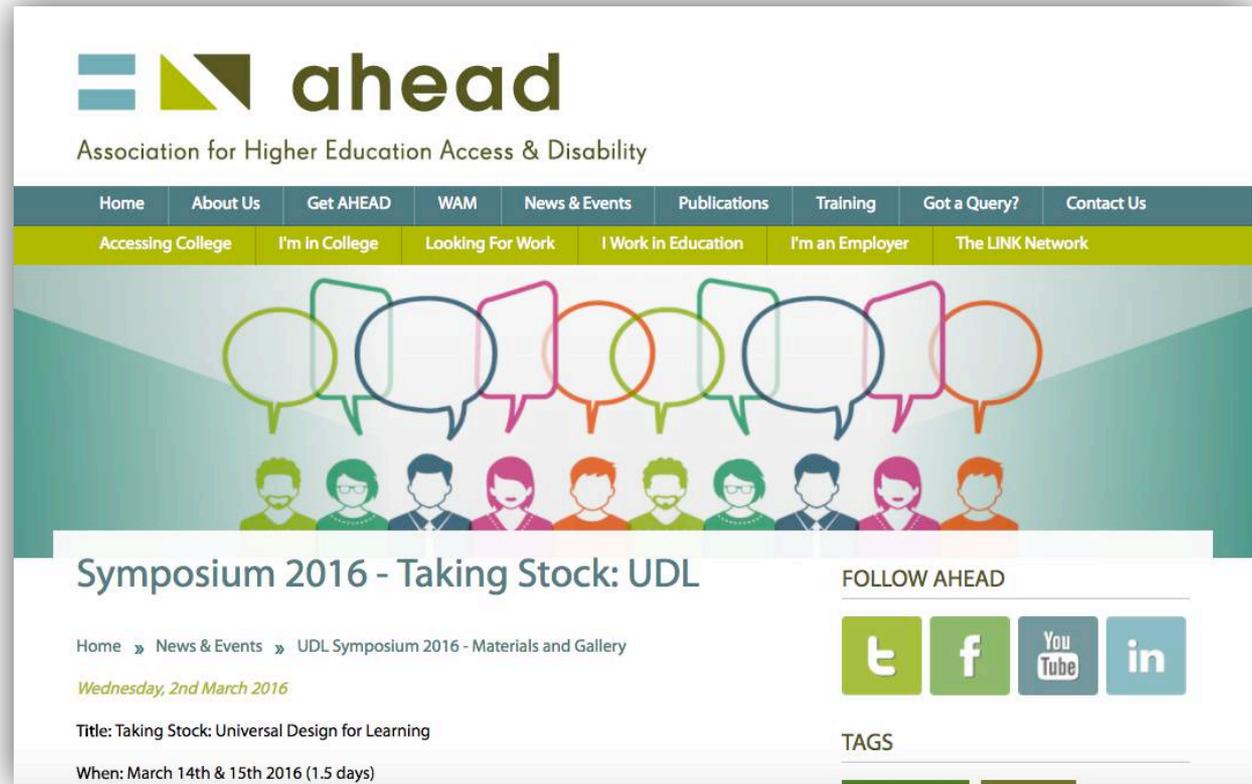
UDL Everywhere ...



This is a screenshot of a website page. At the top, there is a navigation bar with 'Home' on the left and a menu with 'News', 'Opinion', 'Features', 'Career Advice', and 'Multimedia'. The main header area displays the logo 'UA/AU' in large, bold letters, followed by the text 'University Affairs' and 'Affaires universitaires' in a smaller font, and a sunburst icon. Below the header is a black navigation bar with white text for the menu items. The main content area has a red sub-header 'IN MY OPINION' followed by the article title 'You need to know about universal design for learning' in large, bold black font. Below the title is a sub-headline 'If you want to reach all your students, read this.' and the byline 'By JODY GORHAM + BARBARA ROBERTS | August 6, 2014'. There is a 'Post a comment' button and social media share icons for Twitter, Facebook, Google+, and LinkedIn. The beginning of the article text is visible at the bottom: 'Reaching diverse student populations presents many classroom challenges. Requests for accommodation of disability and consideration of international, first-generation and additional language speakers can make curriculum design and delivery complex. How to

Higher Education

UDL Everywhere ...



The screenshot shows the AHEAD website with a navigation menu and a featured article. The navigation menu includes: Home, About Us, Get AHEAD, WAM, News & Events, Publications, Training, Got a Query?, and Contact Us. Below the navigation menu are categories: Accessing College, I'm In College, Looking For Work, I Work in Education, I'm an Employer, and The LINK Network. The main content area features a graphic of colorful speech bubbles above a row of diverse human icons. The featured article is titled "Symposium 2016 - Taking Stock: UDL" and includes the following text:

Home » News & Events » UDL Symposium 2016 - Materials and Gallery

Wednesday, 2nd March 2016

Title: Taking Stock: Universal Design for Learning

When: March 14th & 15th 2016 (1.5 days)

On the right side of the article, there is a "FOLLOW AHEAD" section with social media icons for Twitter, Facebook, YouTube, and LinkedIn, and a "TAGS" section below it.

International

Harvard Educational Review

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Spring 2017



In this Issue:

Harvard Educational Review's
Commitment to Justice and
Equity at a Time of Political
and Social Change

FROM THE EDITORS

**A HARVARD
EDUCATIONAL
REVIEW FORUM**
RESPONDING TO

**"CROSS-POLLINATING
CULTURALLY SUSTAINING
PEDAGOGY AND UNIVERSAL
DESIGN FOR LEARNING:
TOWARD AN INCLUSIVE PEDAGOGY
THAT ACCOUNTS FOR DIS/ABILITY"**

HER ARTICLE

GLORIA LADSON-BILLINGS • H. SAMY ALIM • SUSAN BAGLIERI
DJANGO PARIS • DAVID H. ROSE • JOSEPH MICHAEL VALENTE

Responding to "Cross-Pollinating Culturally Sustaining Pedagogy and Universal Design for Learning: Toward an Inclusive Pedagogy That Accounts for Dis/Ability"

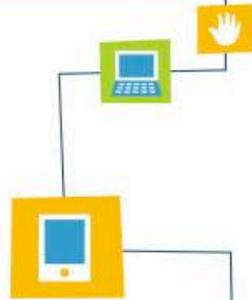
A HARVARD EDUCATIONAL REVIEW FORUM

H. SAMY ALIM, SUSAN BAGLIERI, GLORIA LADSON-BILLINGS, DAVID H. ROSE, DJANGO PARIS, AND JOSEPH MICHAEL VALENTE

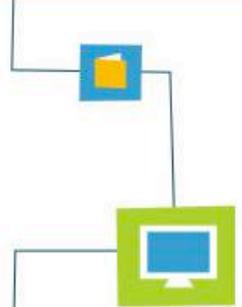


POWERED BY A READY TO LEARN GRANT™

En español



Exploring new ways to
keep kids learning.
Anytime. Anywhere.



Lab Menu



Collections



Games



Activities



Videos



Apps

Collections

Games and activities that build math and reading skills. For kids ages 3 – 8.



Also Cool in the Lab

More learning adventures from PBS KIDS Lab.



PBS KIDS Show



An App for Parents



PBS KIDS Adventure!

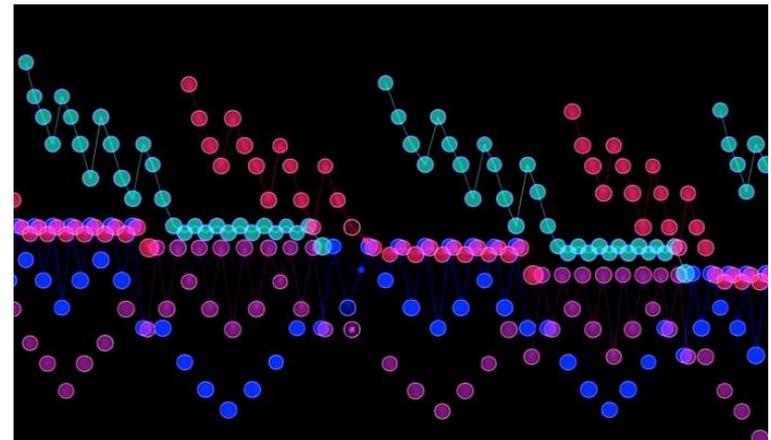


What are the principles and guidelines of Universal Design for Learning **based on?**

Foundations of UDL

Advances in the
cognitive and affective
learning sciences.

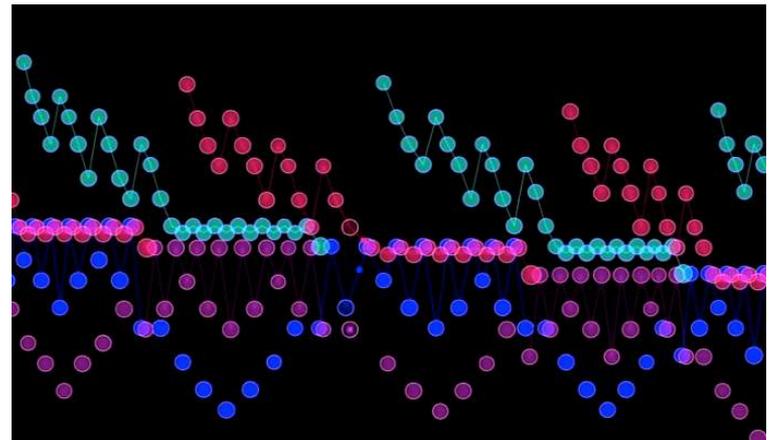
Advances in modern
technologies for
learning.



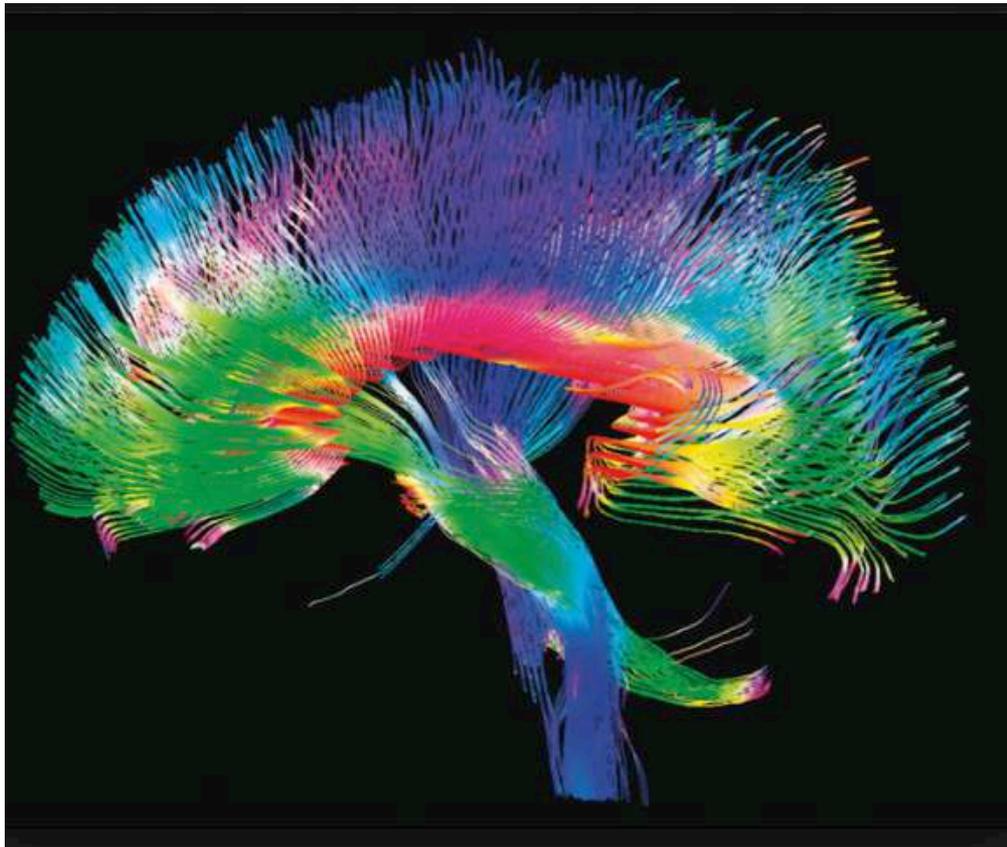
Foundations of UDL

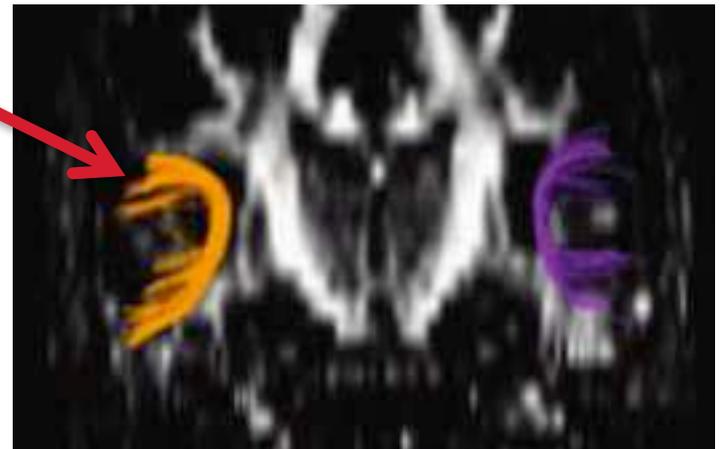
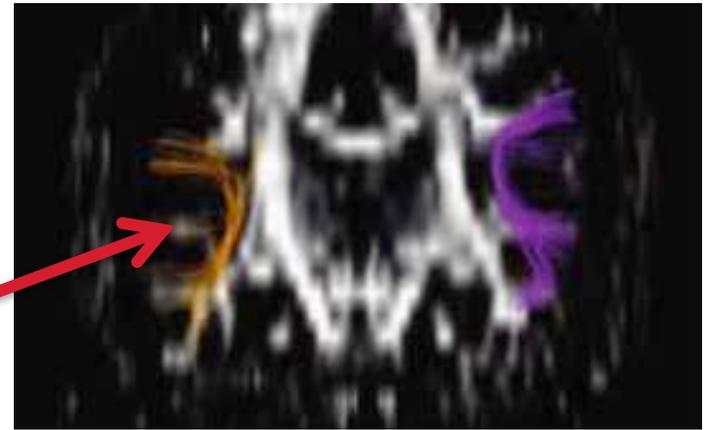
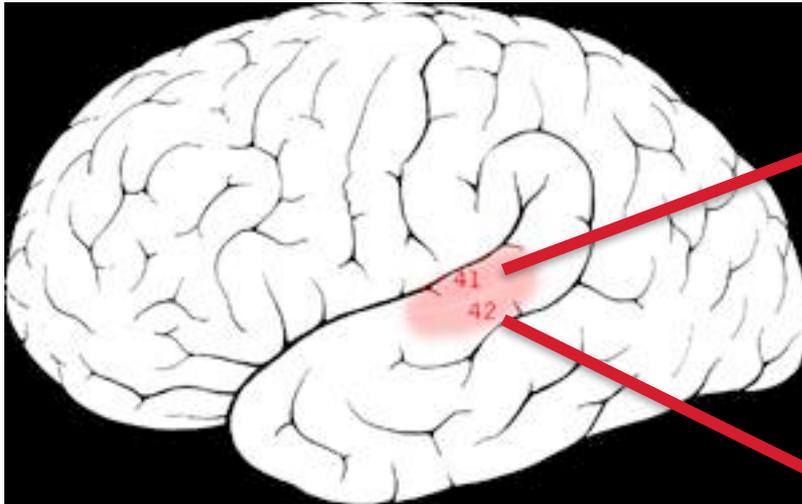
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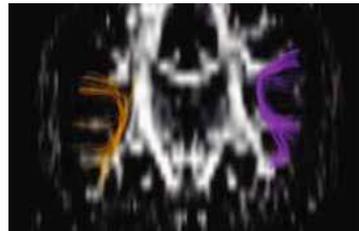


The Connectome



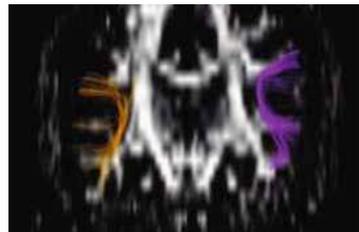


David vs Ruth



Ruth is “hyper-connected”

David vs Ruth

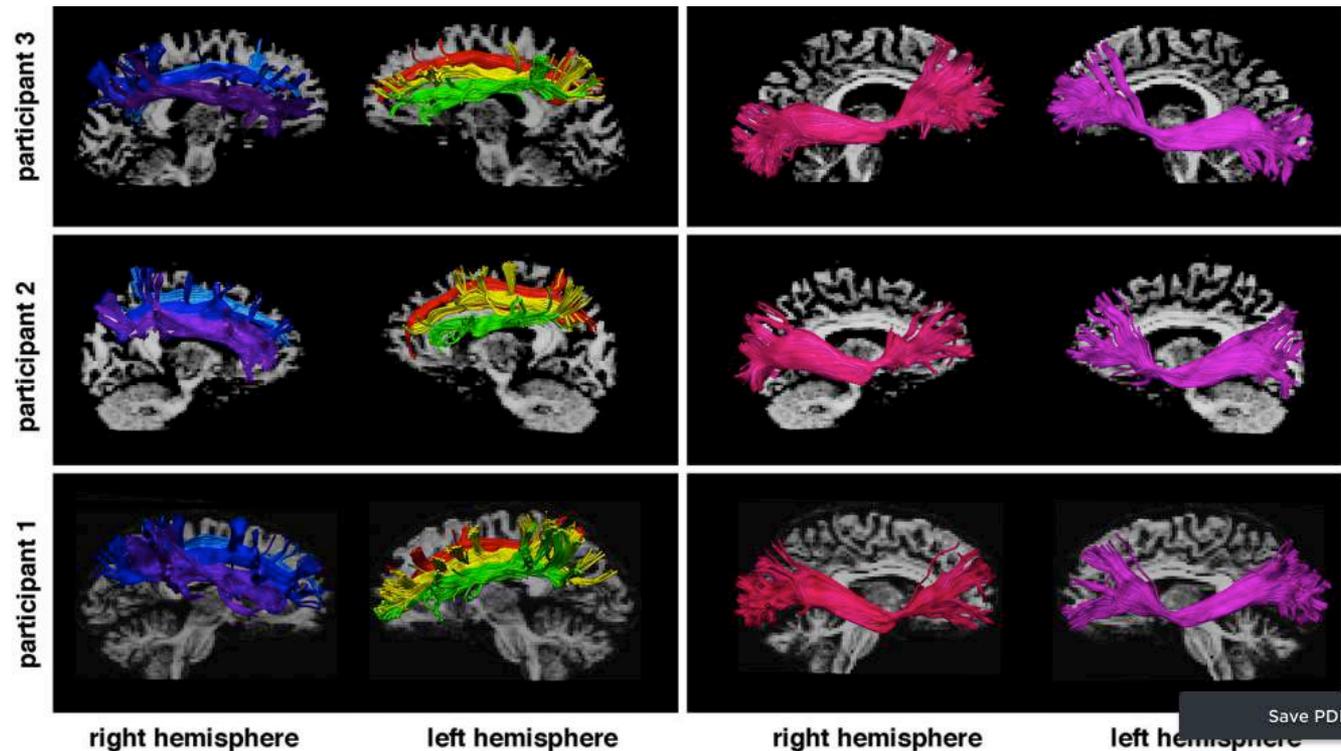


Hypo-acuity
of pitch

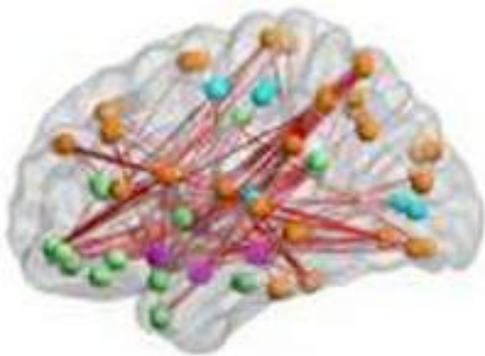


Hyper-acuity
of pitch

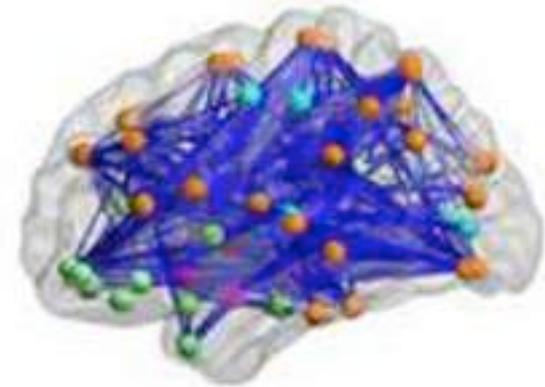
Large variability in the Connectome



One “Spectrum”



Hypo-connectivity



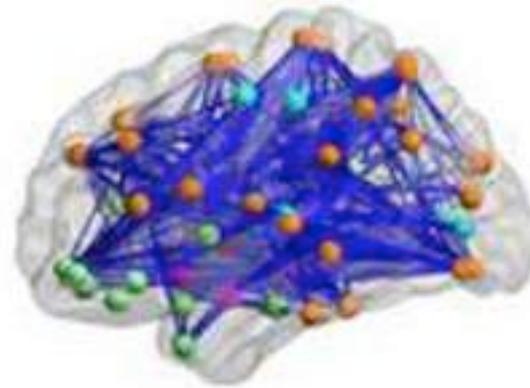
Hyper-connectivity



Typically developing children



Children with autism

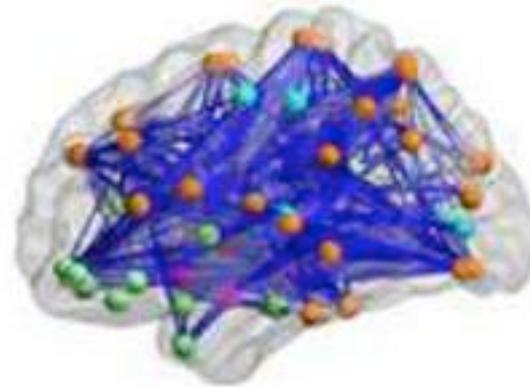


Learners with autism
are “hyper-connected” in many places.

Typically developing children



Children with autism

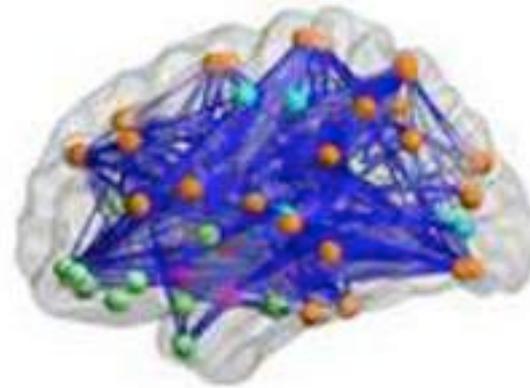


Learners with autism:
“hyper-connected” networks.

Typically developing children



Children with autism



Hyperlexic rather than dyslexic.
Decoding strong; comprehension weak.

The “Reading” Spectrum

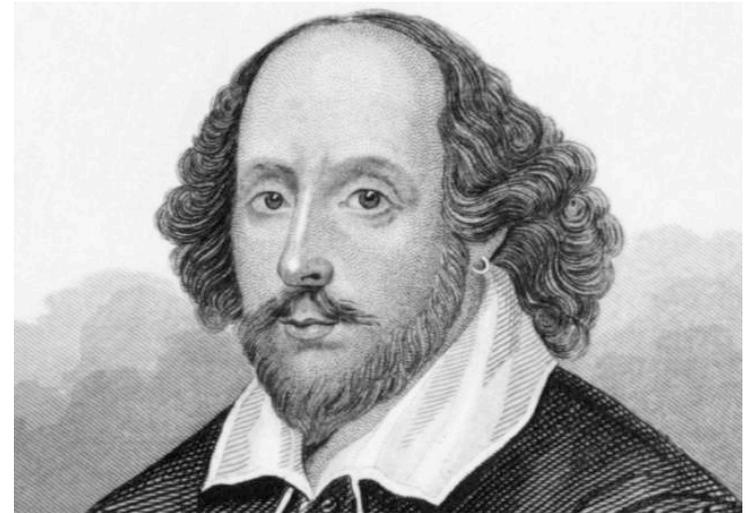
Hyperlexia

Dyslexia

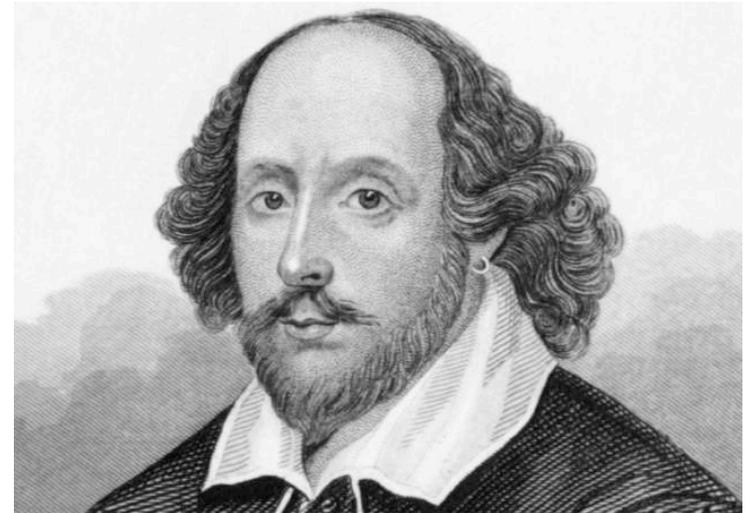
Alexia



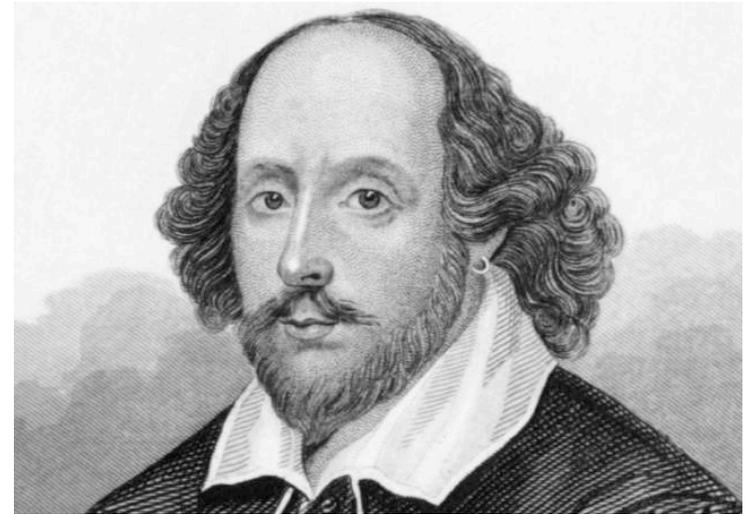
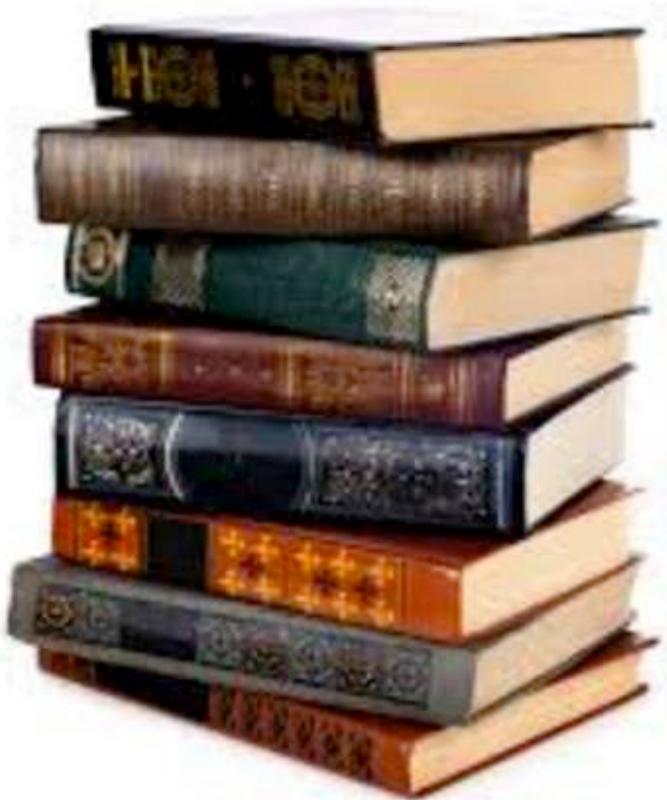
Learning sciences help to identify the important barriers for students



From “Learning Disabilities” to “Print Disabilities”



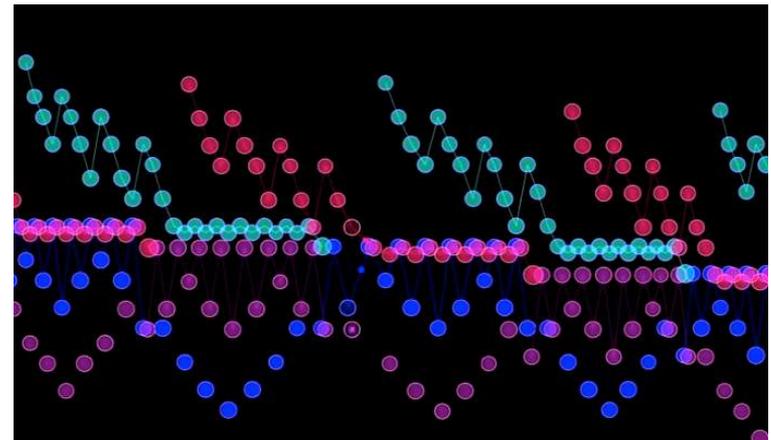
**But that knowledge is not useful
unless there are alternatives**



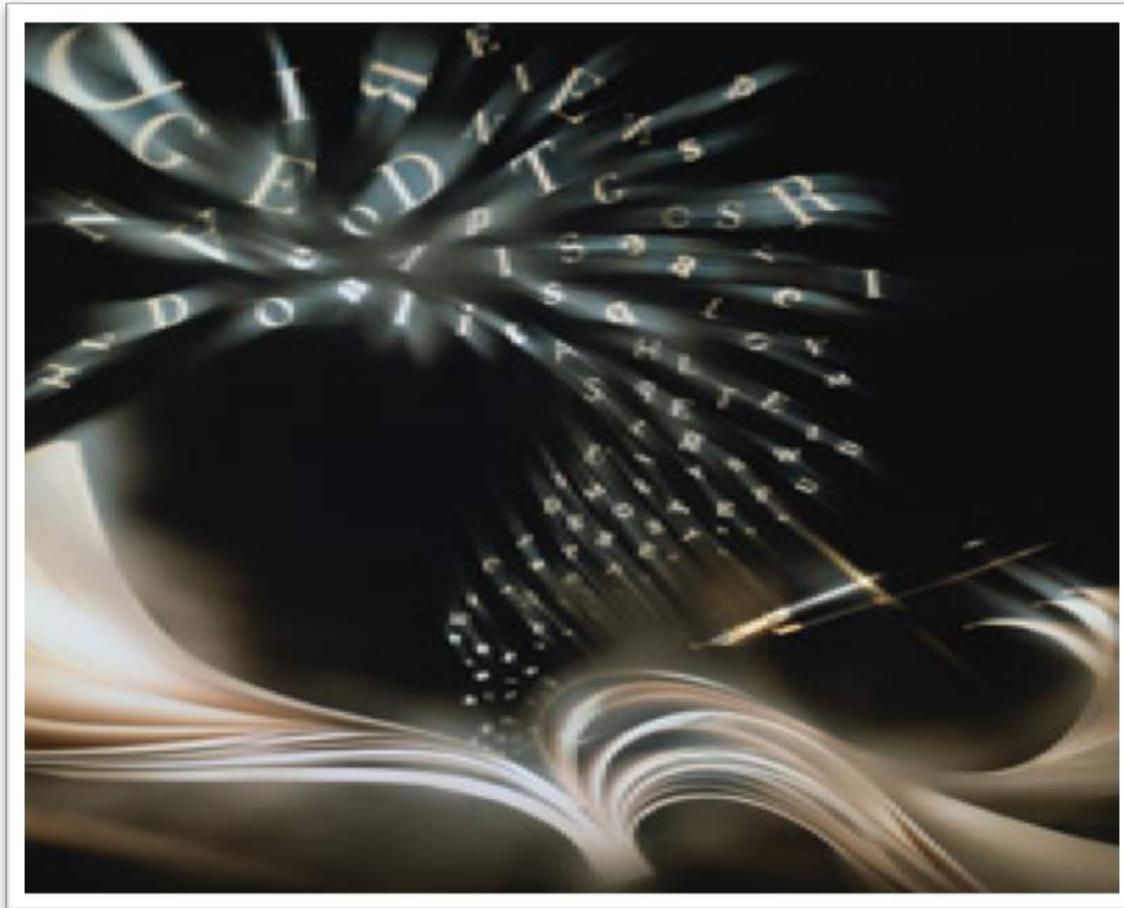
Foundations of UDL

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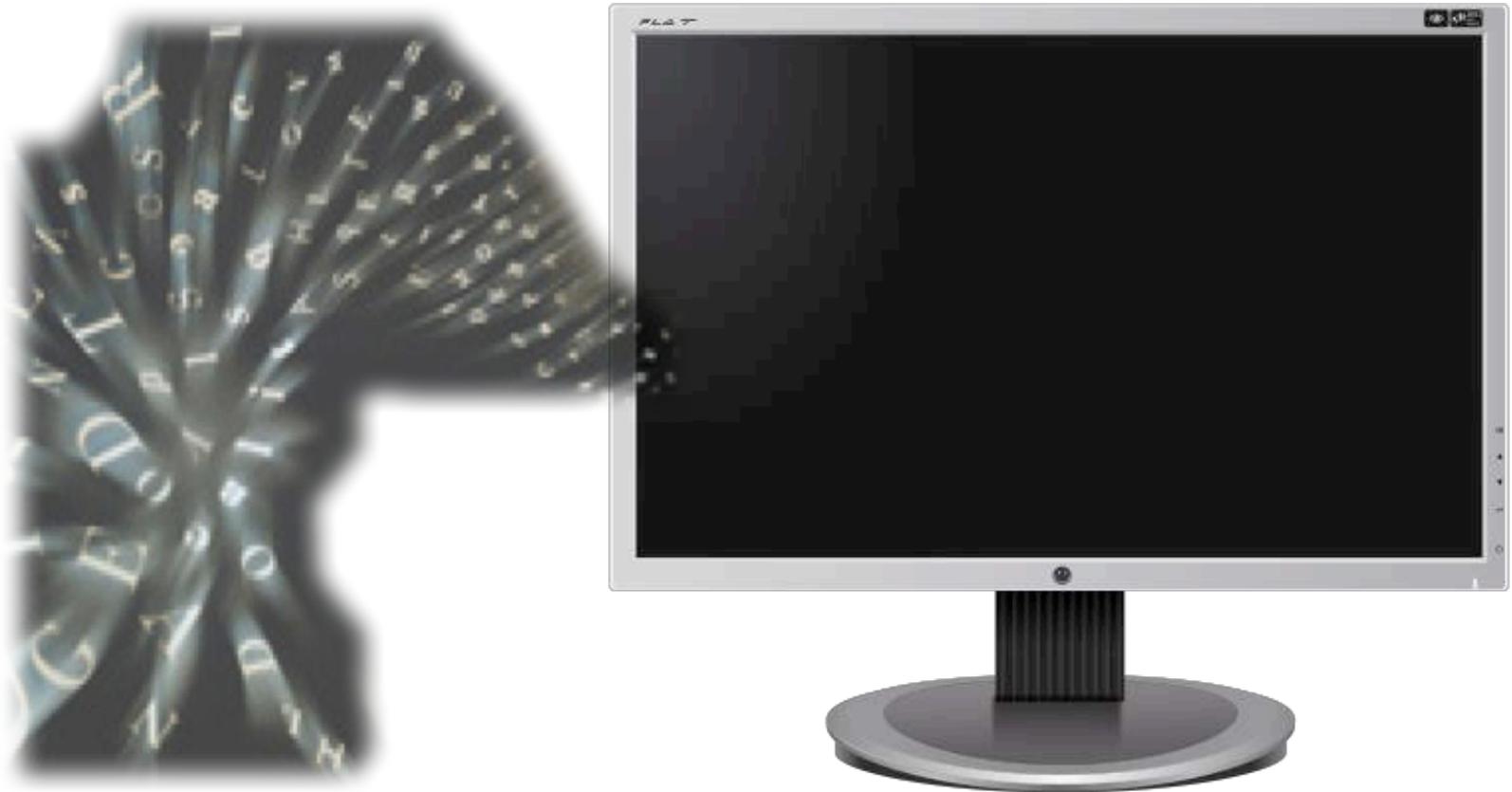
Advances in modern
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Digital Media



A Foundation for Flexibility



Flexible Display

A Tale of Two Cities

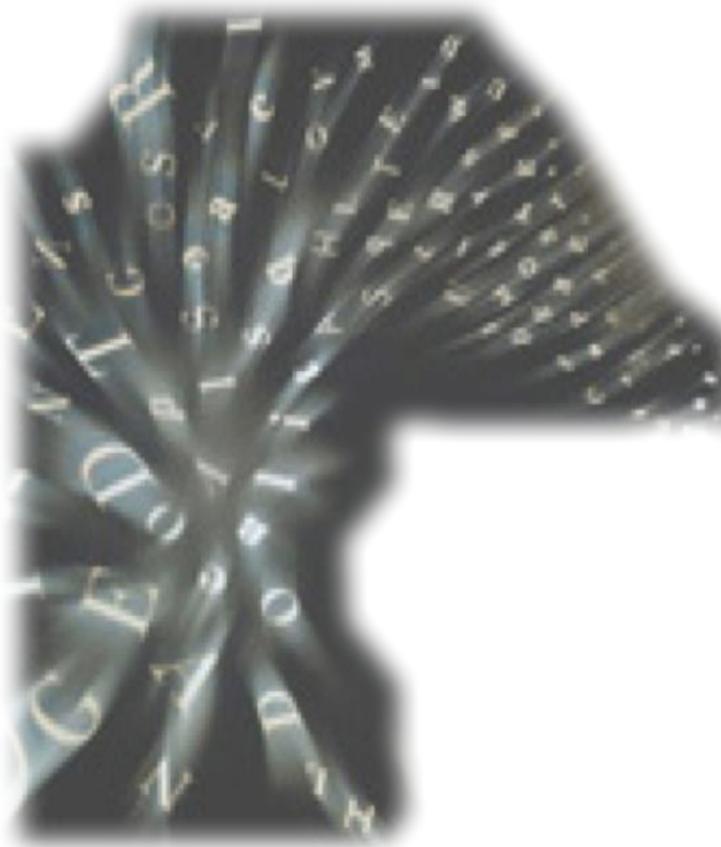
It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of

A Tale of Two Cities

It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season

दो शहरों की कहानी

यह समय का सबसे अच्छा था, यह समय का सबसे बुरा था, यह ज्ञान की उम्र थी, यह मूर्खता की उम्र का था, यह विश्वास का युग था, यह अविश्वास का युग था, यह मौसम का था

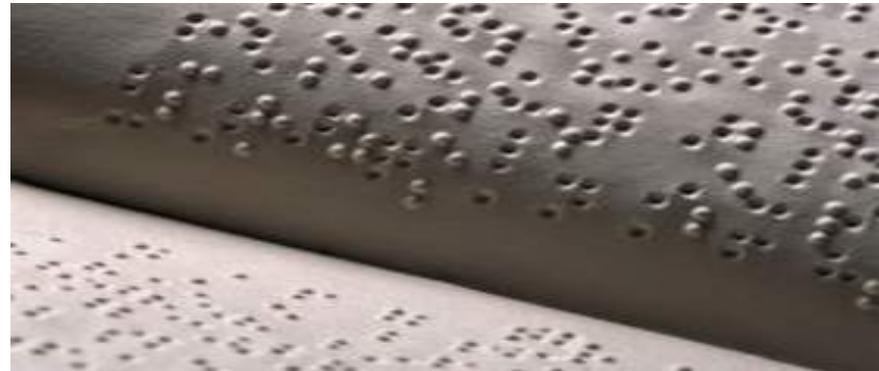


Flexible Display: Multiple Representations

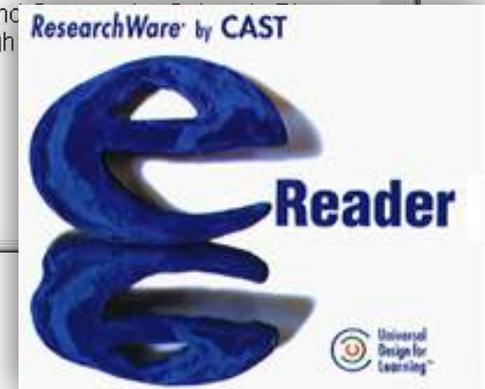
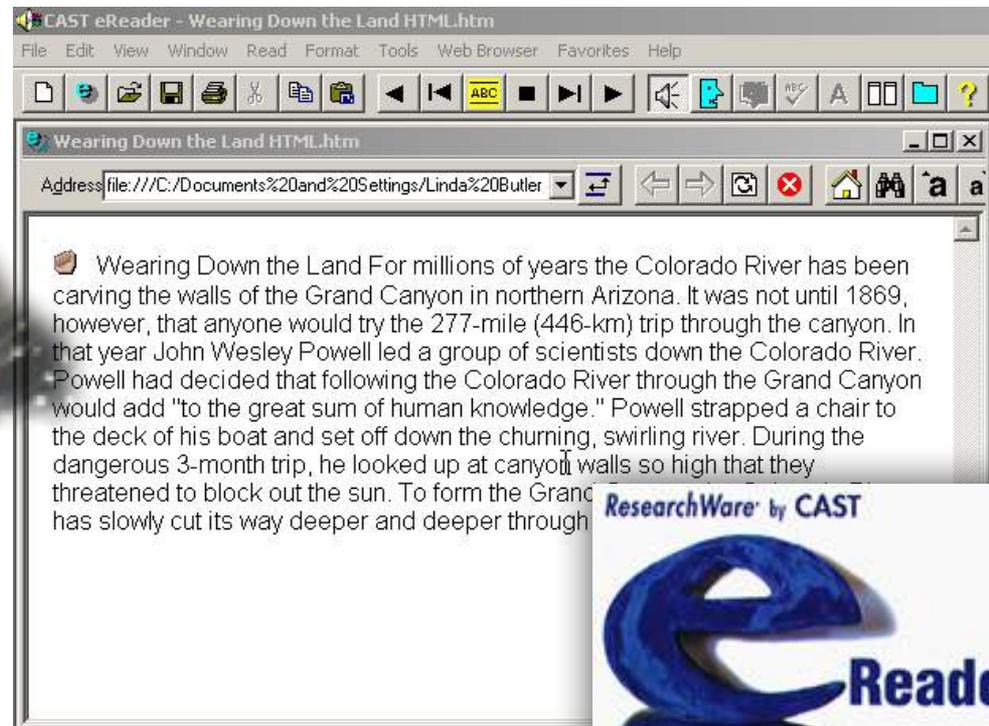


A Tale of Two Cities

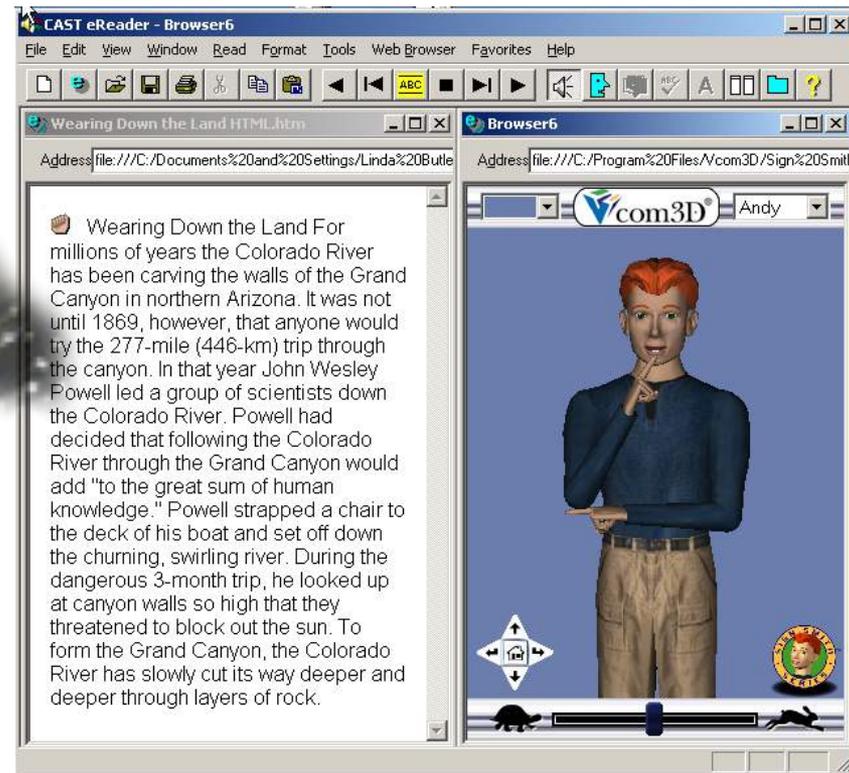
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Flexible Display: Multiple Representations



Flexible Display: Multiple Representations



Resources

- [5 pro tips to make digital learning accessible to all students](#)
Rhianon Gutierrez, ISTE Connects Blog
- [UDL in Synchronous Environments](#)
Kimberly Coy, CEC 2017
- [UDL Tech Toolkit](#)
Karen Janowski & Joyce Valenza
- [UDL Tips Series](#)
CAST Professional Learning

focuses on five simple ways to make it more inclusive:

1. Write alt text for your images.

Students who have visual limitations can use screen reader programs to read the content of a website out loud. But this only works for images if you add alt text describing them.

2. Caption your videos.

Students who are hard of hearing won't understand the audio from videos without captions. They also help visual learners retain content better. Several online tools, such as [Amara.org](https://www.amara.org), [DotSub.com](https://www.dotsub.com) and [Subtitle Horse](https://www.subtitlehorse.com), will help you caption videos for free.

3. Transcribe your podcasts.

Podcasts are audio only, so, by definition, they won't work for those who can't hear — unless you transcribe them into text. There are online tools, such as [Scribie](https://www.scribie.com), that transcribe podcasts for free.

4. Structure your website for ADA compliance.

Public school websites are required by law to follow Americans with Disabilities Act [guidelines](#) that affect the design and coding of navigation menus, links, images, color, tables, multimedia embeds and more. Talk to your IT department or look up the guidelines to keep on the right side of the law while making your content accessible to everyone.

5. Use the right tools.

Gutierrez uses a number of digital tools to create accessible content, ranging from free online tools such as Skype and Google Classroom to paid software, such as the literacy support solution [Read&Write](#).

Pro Tips for Making Digital Learning More Accessible

Design Robust Learning Environments! @digitallearnudl

Definitions in context

Digital = Virtual = Online

Synchronous - live interaction, online

Asynchronous - static information, online

Engagement - Provide a variety of ways for students to work with content

Representation - Provide information to learners in multiple ways

Action and Expression - Provide multiple ways for students to show what they know



Will this work in a digital space?

(Picture of a gold fish jumping out of the water)



They are all human

(Picture of a puppy in the grass)



Let student actions influence teacher actions

(Picture of cats looking back and forth)

<http://castprofessionallea...>

castprofessionallearning.org

UDL in Synchronous Environments

UDL Tips Series

The screenshot shows the CAST Professional Learning website. The header includes the logo and navigation links: Home, Our Services, UDL Resources, About, Connect, and CAST. Below the header is a search icon and the text 'Free UDL Resources and Tips'. A paragraph states: 'CAST Professional Learning is committed to providing free UDL resources for educators, administrators, designers, parents and anyone and everyone who is passionate about UDL. See our resources below and check back often for updates!'. The main content area is titled 'CAST Professional Learning's UDL Tips Series' and features five resource cards, each with an image and a title:

- 
Top 10 UDL Tips for Developing Learning Goals
- 
Top 10 UDL Tips for Assessment
- 
Top 10 UDL Tips for Designing an Engaging Learning Environment
- 
Top 5 UDL Tips for Reducing Stereotype Threat
- 
Top 5 UDL Tips for Learning Environments

UDL Tech Toolkit

The graphic features a central spiral-bound notebook with the text "Free Technology Toolkit for UDL in All Classrooms". Surrounding the notebook are various tool categories on yellow banners: "Graphic Organizers", "About UDL", "Literacy Tools", "Writing Tools", "Study Skills Tools", "Multimedia & Digital Storytelling Tools", "Research Tools", "Text-to-speech", "Speech-to-text", "AudioBooks", "Collaborative Tools", "Math Tools", "Additional Free Tools", "Additional Strategies", and "Useful Links". A child is shown working with a toolbox on the left, and a smiley face icon is at the bottom center. A badge on the left says "NOMINATED FOR BEST EDUCATIONAL TOOL". A "Made with thinglink.. LEARN MORE" button is in the bottom right corner.

Graphic Organizers

About UDL

Literacy Tools

Writing Tools

Study Skills Tools

Multimedia & Digital Storytelling Tools

Research Tools

Text-to-speech

Speech-to-text

AudioBooks

Collaborative Tools

Math Tools

Additional Free Tools

Additional Strategies

Useful Links

Free Technology Toolkit for UDL in All Classrooms

NOMINATED FOR BEST EDUCATIONAL TOOL

Made with thinglink.. LEARN MORE >

Key Questions

THINK ABOUT HOW LEARNERS WILL ENGAGE WITH THE LESSON:

- 1 Does the lesson provide options that can help all learners regulate their own learning?
- 2 Does the lesson provide options that help all learners sustain effort and motivation?
- 3 Does the lesson provide options that engage and interest all learners?

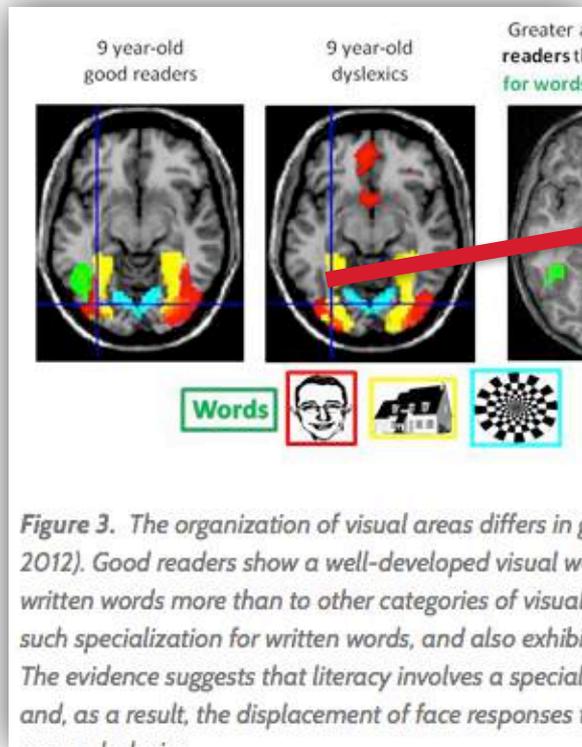
THINK ABOUT HOW INFORMATION IS PRESENTED TO LEARNERS:

- 4 Does the information provide options that help all learners reach higher levels of comprehension and understanding?
- 5 Does the information provide options that help all learners understand the symbols and expressions?
- 6 Does the information provide options that help all learners perceive what needs to be learned?

THINK ABOUT HOW LEARNERS ARE EXPECTED TO ACT STRATEGICALLY & EXPRESS THEMSELVES:

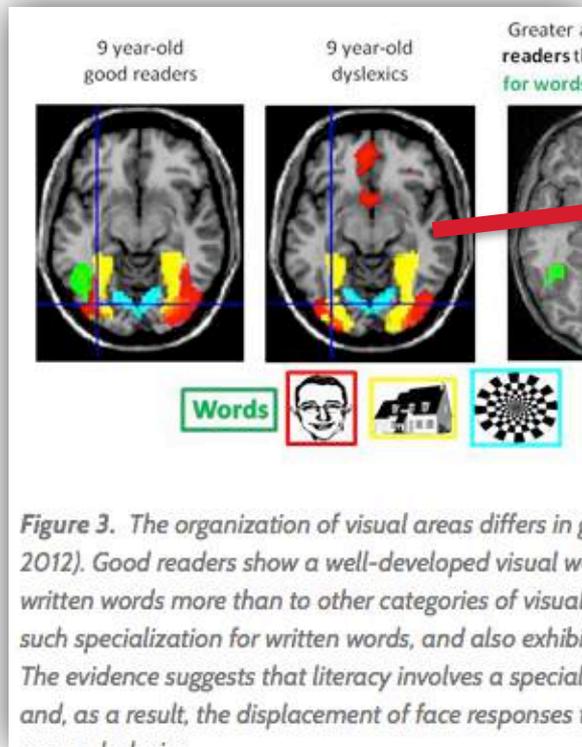
- 7 Does the activity provide options that help all students act strategically?
- 8 Does the activity provide options that help all learners express themselves fluently?
- 9 Does the activity provide options that help all learners physically respond?

In a universally designed networked technology we can increase the pathways (reduce the barriers) to reading.



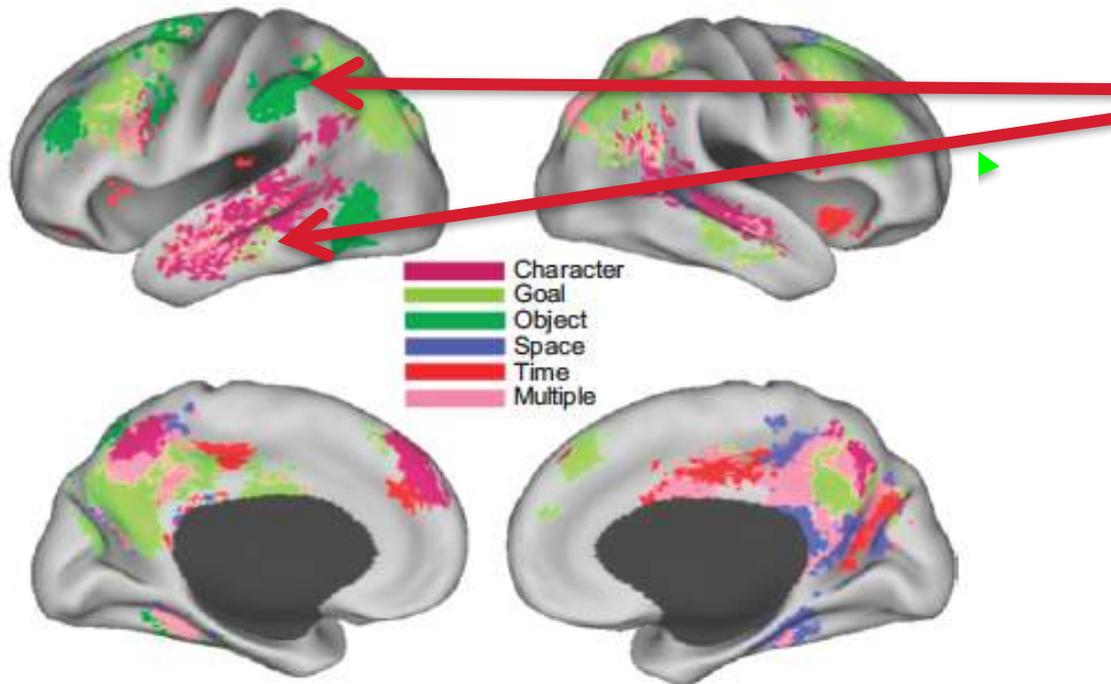
→ Alternatives for decoding
e.g. audio-assisted reading

How does (universally designed) technology change the pathways to reading?

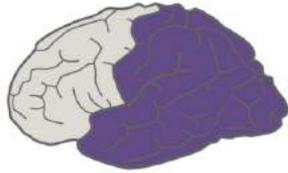


→ Alternatives for vocabulary knowledge
e.g. embedded vocabulary assists

How does (universally designed) technology change the pathways to reading?



Alternatives for background knowledge



Provide Multiple Means of Representation

Resourceful, knowledgeable learners

Provide options for comprehension

- + Activate or supply background knowledge
- + Highlight patterns, critical features, big ideas, and relationships
- + Guide information processing, visualization, and manipulation
- + Maximize transfer and generalization

Provide options for language, mathematical expressions, and symbols

- + 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 perception

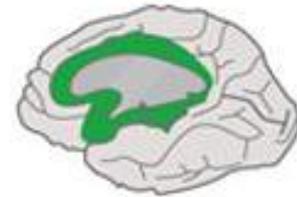
- + Offer ways of customizing the display of information
- + Offer alternatives for auditory information
- + Offer alternatives for visual information

Fortunately, in a UDL universe ...

We can have multiple paths to Shakespeare, all built in.



How do you design for engagement? Emotional Design



Provide Multiple Means of
Engagement
Purposeful, motivated learners

Provide options for self-regulation

- + Promote expectations and beliefs that optimize motivation
- + Facilitate personal coping skills and strategies
- + Develop self-assessment and reflection

Provide options for sustaining effort and persistence

- + Heighten salience of goals and objectives
- + Vary demands and resources to optimize challenge
- + Foster collaboration and community
- + Increase mastery-oriented feedback

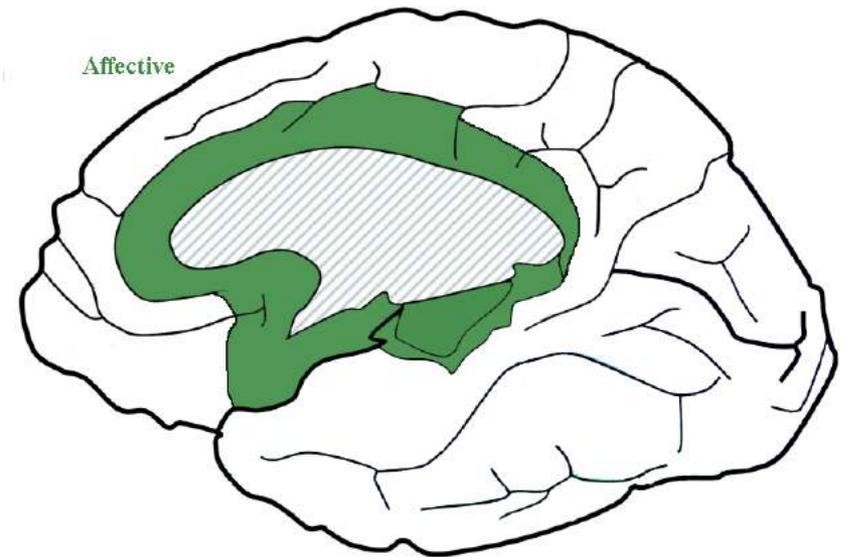
Provide options for recruiting interest

- + Optimize individual choice and autonomy
- + Optimize relevance, value, and authenticity
- + Minimize threats and distractions

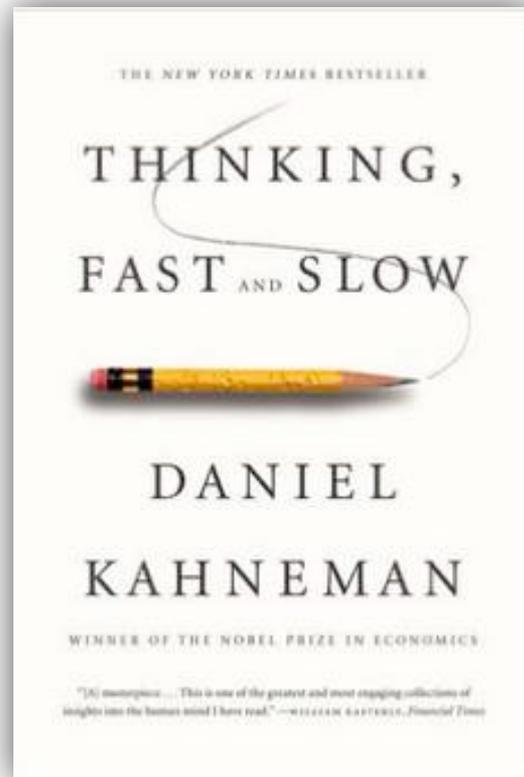
Teaching is emotional work.

Note the anatomy. The “emotional brain” at the center

Evaluate & set
priorities for
attention, action,
and learning.



Two Levels of Engagement Systems



Two kinds of control systems for engagement

Automatic (FAST) System

Recruits Attention & Effort

Automatic

Unconscious

Rapid

Large Capacity

Implicit

Intuitive

Present-oriented

Evolutionarily Old (and perfected)

Executive (SLOW) System

Invests Attention & Effort

Strategic

Conscious

Slow

Limited Capacity

Explicit

Deliberative

Future-Oriented

Evolutionarily New (but cocky)



**How do you measure
the success of your
emotional design?**

How do you measure the success of your emotional design?

Any comprehensive measure of success must always include measures of affect.

An effective emotional design must aim to achieve more than simple mastery of a cognitive capability or a physical skill; it must also aim to achieve emotional success.

The optimal outcome of any educational activity is not merely completion, but learners who are more, not less, motivated to invest more attention and effort ahead, to achieve higher levels of mastery, to go deeper into the domain, to see themselves as lifelong learners.

When the emotional outcomes are different than that—when students are relieved that they are done, satisfied with a passing score, depressed about themselves as learners, hesitant to do anything like this again—then we have an unsuccessful emotional design.

Measuring Engagement The **Executive** (SLOW) System

Measuring Goal-Setting

Measuring Help-Seeking

Measuring Deliberate Practice

Measuring revisions, regressions and recursions

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Measuring Engagement

The **Executive** (SLOW) System

Measuring Goal-Setting

Measuring Help-Seeking

- Use of hints
- Use of models
- Use of scaffolds & supports
- **Use of feedback**

Measuring Engagement

The **Executive** (SLOW) System

Measuring Goal-Setting

Measuring Help-Seeking (Feedback)

- Did learner *seek* feedback?
- Did learner *attend* to feedback?
- Did learner *respond* to feedback?
- Did learner *revise* after feedback?

Measuring Engagement The **Executive** (SLOW) System

Measuring Goal-Setting

Measuring Help-Seeking

Measuring Deliberate Practice

Measuring revisions, regressions and recursions

Measuring Investment (continued)

Measuring expansions and extensions

Measuring self-testing

Measuring self-regulation



Measuring Engagement The **Executive** (SLOW) System

Measuring Goal-Setting

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Measuring revisions, regressions and recursions



Measuring Investment (cont'd)

Measuring Expansions and Extensions

Measuring Self-Testing

Measuring self-regulation

The role of new technologies: New tools for doing emotional work



What are the basic emotions? How can they be measured?

The Great Debate:

