Universal Design for Learning (UDL)
What is it and where does it fit in my teaching?

Presentation located at:
http://cstl-coe.semo.edu/naguinaga/

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Southeast Missouri State University
Welcome

WHO AM I....

Who are YOU?
Goals

• Develop understanding of UDL as an overarching framework for inclusive instructional design.
  – Identify the principles of Universal Design for Learning

• Identify ways UDL can provide access to the general ed curriculum.

• Implement strategies based on UDL principles to infuse digital materials versus traditional curricula.

• Action Plan
Universal Design for Learning

Fist to 5
WHAT IS IT?
WHY DO IT?
HOW DO WE DO IT?
What is UDL?

• Evolved from UD
• A framework
• Based in brain research

Examples?
CAST (not for profit research development organization) believes:

“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
UDL is ... a framework
FOR A FAIR SELECTION EVERYBODY HAS TO TAKE THE SAME EXAM: PLEASE CLIMB THAT TREE
Universal Design for Learning Guidelines

Provide Multiple Means of Engagement
- Purposeful, motivated learners
  - Provide options for self-regulation
    - Flexibly manage and adapt for optimal performance
    - Facilitate learning by selecting different tools
    - Encourage self-assessment and reflection

Provide Multiple Means of Representation
- Accessible, knowledgeable learners
  - Provide options for comprehension
    - Visualize concepts using a variety of representations
    - Enhance understanding through analogies and metaphors
    - Support flexible use of language
    - Facilitate understanding of complex ideas

Provide Multiple Means of Action & Expression
- Strategic, goal-directed learners
  - Provide options for proactive learning
    - Guide students through self-assessment
    - Support planning and strategy development
    - Integrate visual and interactive tools

UDL Wheel

Maryland State Dept. of Education
UDL is ...

- Evolved from UD
- A framework
- Based in brain research
How we Learn!

Passively viewing words

Listening to words

Speaking words

Generating verbs
UDL and the Learning Brain

3D Brain app

identify and interpret patterns of sound, light, taste, smell, and touch

http://www.cast.org
How many faces do you see?
STRATEGIC NETWORKS: THE HOW OF LEARNING

plan, execute, and monitor actions and skills
UDL and the Learning Brain

AFFECTIVE NETWORKS:
THE WHY OF LEARNING

evaluate and set priorities
UDL and the Learning Brain

- One must **recognize** information, ideas, and concepts
- One must be able to **apply strategies** to process the information
- One must be **engaged**

Vygotsky
UDL is not ...

- An intervention
- New
- Technology
UDL is ... rooted in 3 principles

- Multiple Means of Representation “WHAT”
- Multiple Means of Expression “HOW”
- Multiple Means of Engagement “WHY”
**Universal Design for Learning**

**Big Idea**

Students differ from each other in the ways they think and learn. *Universal Design for Learning* (UDL) is a set of principles designed to guide curriculum and lesson development to ensure that all individuals have equal opportunities to learn and can quickly engage with the instruction. Digital technologies, online resources, and mobile devices can be used to design flexible instruction with options to support all students in achieving the Florida Standards.

**Flexibility in Representation**
- options for perception
- options for language and symbols
- options for comprehension

**Flexibility in Expression**
- options for physical action
- options for expressive skills/fluency
- options for executive functions (planning/monitoring)

**Flexibility in Engagement**
- options for recruiting interest
- options for sustaining effort/persistence
- options for self-regulation

*Universal Design for Learning* is based on research about how we recognize information, how we organize and express our ideas, and how we are challenged or engaged.
Universal Design for Learning is based on research about how we recognize information, how we organize and express our ideas, and how we are challenged or engaged.

**Recognition Networks**

How we recognize information and categorize what we see, hear, and read. For example, students can change the font size of the reading material, use tools to change the format (e.g. from text to audio, or to braille), change the background colors, etc. Online glossaries or dictionaries are available to support vocabulary. Translation tools are provided to support multiple languages. Advance graphic organizers may be used to help students highlight big ideas, concepts, and relationships.

**Strategic Networks**

How we organize and express our ideas; plan and perform tasks. For example, students may produce a report in an essay format, a PowerPoint format, an audio format, a movie, a play, a series of photos. A variety of tools may be provided to help students organize information; e.g. checklists and guides for note taking. Supports are provided for time management, setting goals, and completing assignments. Project planning templates may be provided.

**Affective Networks**

How we are challenged, excited, or interested. For example, students are able to choose topics and viewpoints to research. Assignments have a level of relevance for each student. Hands-on activities, robotics, simulations, and immersive virtual worlds may be used to support STEM instruction. Collaborative activities are used to help students connect with and work with others. Time is provided for self-assessment and reflection activities.

[External links]

National Center on Universal Design for Learning
http://www.udlcenter.org/
The starting point to learn about UDL.

UDL Learning Wheel
http://udlwheel.mdonlinegrants.org/
Interactive online tool for exploring UDL.

iOS Apps to Support Reading & Writing
Ideas for supporting reading, writing, and research.

Reading and Study Digital Tools
Reading support features in WORD and other programs.
WHY UDL?
Why UDL?

- Learning is unique to individuals
- Abilities continually shift
- Intersection between individual and environment
- An average student is mythical
- Variability
Why UDL?

• States, provinces are turning to UDL as a means of helping educators meet the demand to provide standards-based education to all learners while recognizing and honoring individual variability and diversity.

• General Education initiative

• The U. S. Dept. of Education, the National Science Foundation and major foundations and corporations are supporting initiatives to expand UDL
Why UDL

• This past December, Congress passed the Every Student Succeeds Act (ESSA), which replaces No Child Left Behind. And for the first time, the nation’s general K-12 education law defines and endorses Universal Design for Learning.

• “UDL is referenced numerous times throughout the ESSA bill, and states are encouraged to design assessments using UDL principles, to award grants to local education agencies who use UDL, and to adopt technology that aligns with UDL...”
Policy

• National UDL Task Force
• UDL is defined in IDEA 2004 and the Assistive Technology Act of 1998
• U.S. Department of Education’s National Educational Technology Plan

http://www.udlcenter.org/advocacy
Policy

• Common Core Standards Initiative – FAQ
• Several States have Statewide Initiatives
• NIMAS/AIM
• Higher Education Opportunity Act (HEOA)

http://www.udlcenter.org/advocacy/referencestoUDL
Keeping up with the world leaders

- Self-directed learners
- Collaborative learners

Singapore
Participatory Culture

- Affiliations
- Expression
- Circulation
- Collaborative problem solving
Access and Equity
Paradigm Shift

- Curriculum
- Technology
- Knowledge
TECHNOLOGY IS A GIVEN

NOT A DEBATE
Technology has Changed Everything

• Communication
• Any time, any place, any how (any path, any pace) learning
• Personalization
• Openness, sharing
• Participation in content, knowledge, and news production
• Collaboration

GPS Analogy

- What is the present location?
- What is the destination or goal?
- What is the best route for reaching that goal?
Change is necessary

• Teaching to the middle leaves many behind
• Focus on the margins
• Create access
• Embrace technology!
Paradigm Shift

• Curriculum

• Technology

• Knowledge
Teach & Assign Verbs (Skills)

and

Give students the choice of Nouns (Tools)

Prensky, 2013
A recent @marcprensky tweet

“Our education needs more self-direction. Kids should leave school with self-knowledge, self-discipline, and the ability to teach themselves.”
“We cannot always build the future for our youth, but we can build our youth for the future.”

-Franklin D. Roosevelt
Review

Paradigm Shift?

Intervention?

Why?

Principles?
WHERE DOES DIFFERENTIATED INSTRUCTION FIT IN?

Balanced, research based practices
Differentiation is...

- A teacher’s **response** to learner needs
- The **recognition** of students’ varying background knowledge and preferences
- Instruction that appeals to students’ difference
- Gives students multiple options for taking in information and making sense of ideas
The flexibility of digital curriculum makes it easier than ever to adjust the challenge level of academic tasks.

The concept of a volume control slider is a useful metaphor for describing the supports available in a universally designed learning environment.

Tomlinson (1999) uses the term “equalizer” to discuss the concept of a slider.
Differentiated Instruction

In a differentiated classroom, teachers begin where their students are, not where they feel she should be or as the curriculum dictates.

Instruction methodologies vary and are adapted to meet the needs of individual and diverse learners.
<table>
<thead>
<tr>
<th>Universal Design for Learning</th>
<th>Differentiated Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principles and Network-Appropriate Teaching Methods</td>
<td>Corresponding Content, Process and Product Tenets as well as Additional Guidelines</td>
</tr>
<tr>
<td>Principle 1 and the Recognition Network: a) Provide multiple examples, and b) Provide multiple media and formats,</td>
<td>Content: Several elements and materials used to support instructional content</td>
</tr>
<tr>
<td>Principle 1 and the Recognition Network: c) Highlight critical features,</td>
<td>Content: Instruction is content-focused and principle-driven</td>
</tr>
<tr>
<td>Principle 2 and the Strategic Network: a) Flexible models of skilled performance, b) Opportunities to practice with supports.</td>
<td>Additional Guidelines: Engaging all learners is essential</td>
</tr>
<tr>
<td>d) Flexible opportunities to demonstrate skill.</td>
<td>Product: Students are active and responsible explorers.</td>
</tr>
</tbody>
</table>
Connecting UDL and Other Initiatives

- Differentiated Instruction
- RTI
- Common Core
Where does Response to Intervention fit in?

- A multi-tier approach to the early identification and support of students with learning and behavior needs.

- Begins with high-quality instruction and universal screening of all children in the general education classroom.

- Struggling learners are provided with interventions at increasing levels of intensity to accelerate their rate of learning.

UDL HAS SUPPORTS BUILT IN
RTI and UDL share the objective of improving educational outcomes and both:

- recognize that poor achievement does not necessarily reflect disability, but rather may also reflect poor instruction

- Incorporate research-based practices

- reflect the understanding that a curriculum that is effective for one student may not be effective for another

- RTI and UDL treat assessment as something that should inform instruction and intervention and consider once-a-year test scores insufficient to determine student ability
UDL, DI and RTI

- **PLAN** a change or action
- **DO** the change or action (on a small scale at first)
- **STUDY** the results to learn what did and did not work
- **ACT** by refining the idea or by implementing it on a broader scale
## Pulling it all together

<table>
<thead>
<tr>
<th>LEARNING</th>
<th>UDL</th>
<th>DI</th>
<th>RTI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What</strong></td>
<td>Recognition network- Multiple means of representation</td>
<td>Content</td>
<td>Curriculum</td>
</tr>
<tr>
<td><strong>How</strong></td>
<td>Strategic network- Multiple means of expression</td>
<td>Process</td>
<td>Instruction</td>
</tr>
<tr>
<td><strong>Why</strong></td>
<td>Affective network- Multiple means of engagement</td>
<td>Product</td>
<td>Learning</td>
</tr>
</tbody>
</table>
Where do other theories fit in

• John Hattie and Instructional Quality
• Identified five major dimensions of excellent teachers. Expert teachers
  – can identify essential representations of their subject,
  – can guide learning through classroom interactions,
  – can monitor learning and provide feedback,
  – can attend to affective attributes, and
  – can influence student outcomes
Marzano, DOK & UDL = Multiple Means of Applying Marzano

- Multiple means of Identifying Similarities & Differences
- Multiple means of Cues, Questions & Advanced Organizers
- Multiple means of Generating & Testing Hypotheses
- Multiple means of Summarizing & Note-taking
- Multiple means of Setting Objectives & Providing Feedback
- Multiple means of Reinforcing Effort & Providing Recognition
- Multiple means of Cooperative Learning
- Multiple means of Nonlinguistic Representations

DEPTH OF STUDENT LEARNING AND ACHIEVEMENT
Barriers

• Funding Sources
  – Many resources are free or extremely reasonable
• Deficits in teacher knowledge
• Lack of teacher time, training, teamwork related to UDL
  – Develop school and district teacher tech teams, website, mentoring
• Availability of workshops and training sessions
• Adjustment of teacher attitudes and dispositions regarding technology
Alternative representation

http://www.youtube.com/watch?v=A8QWLrl-G78
Effective inclusion can be best served by a systems thinking approach - multiple tactics implemented and integrated in a coordinated matter.
HOW?
Separate the goals from the means

Not always tech - there is power in digital text but need to think about FIRM goals and FLEXIBLE needs!

Using a curriculum that is rooted in the 3 UDL principles, students have:

1. **Options** for how they learn
2. **Choices** which will engage their interest
3. **Choices** for how they demonstrate their learning

Teachers provide:
1. **Flexible** ways of presenting lesson content
2. **Flexible** options for student engagement
3. **Flexible** methods of expression and assessment
Above & Beyond

Separate Goal from Means
Digital Media

- Transformable
- Taggable

Print materials - Inflexible, finite
Backwards design instructional process

• Establish **Clear** Outcomes
• Anticipate Learner **Variability**
• **Measurable** Outcomes and Assessment Plan
  – Timely Progress Monitoring
• **Flexible** methods, materials
• Instructional Experience
• Reflection and New Understandings
Personalization

- Firm goals
- Flexible means
- Options, Choices
Need for personalized learning

The variance across individuals is the norm

Diversity is what makes us great

Sir Ken Robinson
Engagement

Redefinition
Expression and creativity
The technology unleashes creative potential and disrupts perceptions of disability

Modification
Leveraging multimedia
The technology provides multiple means of expression

Amplification
Built-in supports and scaffolds
The technology includes supports that account for learner variability

Substitution
Access to content and tools
The technology eliminates barriers that prevent access to information and communication

SAMR UDL Luis Perez.png
SAMR model developed by Dr. Ruben Puentedura
Tech Integration

- Tech integration - easy to lose track of fundamentals through technical issues
- Digital citizenship
- Develop a culture that supports technology
Provide Multiple Means of Representation

Guideline 1: Provide options for perception

- Checkpoint 1.1: Options that customize the display of information

Guideline 2: Provide options for language and symbols

Guideline 3: Provide options for comprehension
Examples of addressing learner variability from *Learner Variability and UDL*

**I. Provide Multiple Means of Representation**
- Make text available in a variety of formats: e-Text reader, audio, MS PowerPoint
- Offer a variety of media to access information
- Provide multiple visual and physical examples of information using, for example, manipulatives, Smart Boards, iPads
- **Additional examples:**

**II. Provide Multiple Means of Action & Expression**
- Present learners with choices of tools to demonstrate knowledge. For example, provide a “technology toolkit” on a class wiki with reviews of available tools and resources
- Implement project-based learning to provide opportunities for problem solving and to help guide effective goal-setting
- Other examples: audio recording, dramatic productions, creating charts, graphs and illustrations, and free websites like Blogmeister, Glogster, Toondoo, Animoto, Xtranormal, Voki
- **Additional examples:**

**III. Provide Multiple Means of Engagement**
- Teach students how to use the available formats, tools and technology
- Implement project-based learning opportunities to provide options for individual choice and enhance the relevance and authenticity of the learning
- Give choices of tools, technology, medium, work environments and topic
- Guide students to understand personal learning needs so they can make good choices and become more autonomous
- Provide opportunity for independent choices of participation, for example, standing during a lesson
- **Additional examples:**
What is possible with technology

- Kathy Schrock ipads
- Wolfram Alpha – computational knowledge engine
- Kid Rex
- Kids Wordsmyth
- You tube – CC – 60+
- Free tech for Teachers
- Microsoft Partners in Learning – free tools
Osmo

Timeless tools, reimagined
Echo Smartpen in Early Childhood

Overview

EC Video
(1) audio flashcards
(2) oral book reports & projects
(3) book commentaries
(4) set up FAQ pencasts
(5) braille periodic table
(6) talking test- for students who need test read out loud
(7) word wall (sound stickers)
(8) lesson plan aid for substitute
(9) reading fluency test
“I’m no longer scared about school.”

Livescribe smartpens let you focus on the important stuff – all with a simple tap.
Reimagine Learning

Richard Calutta
UDL Implementation: A Process of Change
Edmodo

* Pose questions to students about novels and math concepts.

* Have students converse via Edmodo on academic topics.

* Poll students on current events.

Principal 1: Provide Multiple Means of Representation:
  * Checkpoint 3.3: Guide information processing, visualization, and manipulation.

Principal 2: Action and Expression:
  * Checkpoint 5.1: Use of multimedia for communication
  * Checkpoint 5.2 Use multiple tools for construction and composition.

Principal 3: Engagement:
  * Checkpoint 7.3: Minimize threats and distractions.

Baltimore Teacher example: Stephani Schindler
Personalized Learning and Accessibility
• The importance of accessibility
• Impacts in the classroom
• What is accessibility?

Overview of Accessibility Features
• Windows, Internet Explorer, Office
• Try it out

Impairments and Technology Solutions
• Types of impairments

Selecting Accessible Technology
• Impact of accessibility on the role of different school stakeholders
• Scenarios and accessibility solutions for students with different types of abilities including special needs

Accessibility in Practice
• Breakout sessions: 4 student scenarios

Resources
Microsoft Accessibility
Digital Examples of Materials: Bookbuilder

http://bookbuilder.cast.org/
UDL Editions

Offers classics from world literature like you've never seen them before -- in a flexible online interface that supports and engages novice and expert readers alike.

Flexible digital media to reach and engage all learners. Leveled supports and the Texthelp Toolbar balance challenge and support for each learner, ages 10 and up. Video
Readability (online) - http://www.readability.com. Simplifies web page layout, reduces distractions, changes font size and background color
Read:Outloud (Win Mac) - http://www.donjohnston.com/products/read_outloud. Reading and study support program that works with web pages, digital files, PDFs
Wordle (online) - http://www.wordle.net. Tool for creating word clouds
Online Text Summarizer (online) - http://www.tools4noobs.com/summarize. Type in an URL or paste text and get a summary of main points

Free Online Graph Paper (online) - http://incomptech.com/graphpaper/. Tools for creating a wide assortment of graph papers
WriteOnline (online, Win, Mac, iOS) - http://bit.ly/1g6zETJ. Writing tool that includes text-to-speech, word bars, and word prediction. Free trial
Rationale (Win) - https://www.rationaleonline.com/. Guided reasoning and argument construction software
Science Writer (online) - http://sciencewriter.cast.org. Tool to support science writing assignments

MoffSoft FreeCalc (Win) - http://www.moffsoft.com/freecalc.htm. Basic calculator with adjustable size, colors, and a simulated paper tape display
WebMath (online) - http://www.webmath.com/. Tool that solves math problems with explanations
Illuminations (online) - http://illuminations.nctm.org/. Collection of interactive activities and math lessons, e.g., Advanced Data Grapher, Dynamic Paper
InspireData (Win, Mac) - http://www.inspiration.com. Applies proven strategies of visual learning to data literacy

Education Place (online) - http://www.eduplace.com/kids/hmsc/. Collection of science resources and simulations from Houghton Mifflin
LearningScience (online) - http://www.learningscience.org/. Learning community
Windows to the Universe (online) - http://www.windows.ucar.edu/. Content lessons on our planet, solar system, and the universe with leveled text in English or Spanish
Science Buddies (online) - http://www.sciencebuddies.org/. Science fair project ideas
• **UDL Toolkit**
• **UDL Resource**
• **Strategy Gallery**
• **Sample UDL Book**
Implementation

• Support teacher development
• Support teacher to teacher learning
• Plan for Scale
• Publicly acknowledge successes
• Assess progress
Maryland Learning Links

• Learning Links

• UDL Links App

UDLinks
By Maryland State Department of Education
Open iTunes to buy and download apps.

Description
This app is for teachers and parents to search for content specific online teaching resources aligned with Universal Design for Learning. Users can complete a "Class Profile" narrowing the resources by content, grade level and topic. When prompted, questions in the profile tool narrow the search further by asking questions aligned with UDL. In the

Maryland State Department of Education Web Site › UDLLinks Support ›

What's New in Version 1.1
Updates for version 1.1 include a new content area for school counseling and more ways to share resources -- in addition to email, you can now share on Facebook or Twitter!
Gates Foundation Grant

Four District examples
Administrators can...

- Adopt principles
- Provide access to PD
- Provide time for collaboration
- Walk the walk
Taking Action

- Key Players
- Actions
- Benefits of Implementation
- Possible barriers
- Possible solutions
- Needed resources
- Timeline
"UDL is really a merging of general education and special education, a sharing of responsibility, resources and ownership. It gets away from the "their kids/our kids" divide between general ed. and special ed."

– David Rose

A Practical Reader in Universal Design for Learning
The goal of education

• Not simply the mastery of knowledge
• It is the mastery of learning
• Education should help turn novice learners into expert learners
• Develop individuals who know how to learn, who want to learn, and who, in their own highly individual ways, are well prepared for a lifetime of learning
CAST resources

Free online tools to make education more engaging and accessible for all.

1) **UDL Studio** - Allows anyone to make universally designed educational materials with levels of learning supports.

2) **UDL Exchange** - Enables preK-12 educators to create, mix, and share instructional resources based on UDL and aligned to the Common Core State Standards.

3) **UDL BookBuilder** is a free resource to help teachers and parents develop their own digital books to support reading instruction for children ages 3 and up. Enables users to create, edit, and save their own online books.

4) **UDL Curriculum Self-Check** provides an interactive tool to help educators identify areas of the curriculum where barriers may exist or more supports for diverse learners are needed.

and more...

http://www.cast.org/our-work/learning-tools.html#.VQ4vIcE5dSU
Resources

CAST – Center for Applied Special Technology

National Center on Accessing the General Curriculum

UDL in Prince George’s County Public Schools

Teacher Toolkits

IRIS Center - UDL
Universal Design for Learning in the Classroom
Practical Applications

Edited by Tracey E. Hall, Anne Meyer, and David H. Rose

158 Pages
Size: 7" x 10"

Paperback
August 2012
ISBN 978-1-4625-0631-6
Cat. #0631
Price: $20.00 $23.80
order

Hardcover
August 2012
ISBN 978-1-4625-0635-4
Cat. #0635
Price: $50.00 $42.50
order

E-book
July 2012
ISBN 978-1-4625-0637-8
EPUB format
Price: $20.00 $23.80
order
• What did I learn?

• Why did I learn it?

• How can I use it?
“Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid.”

- Albert Einstein
Be a leader
Thank you

Nancy Aguinaga

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