UNIVERSAL DESIGN FOR LEARNING
Implications for Practice

Dr. Nancy Aguinaga
Southeast Missouri State University
Introductions

• My background
• What are you hoping to gain from this workshop?
  • Discuss with someone near you – 1 minute.
    • In one sentence report back
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 several strategies based on UDL principles to infuse digital materials versus traditional curricula.

• Action Plan
Universal Design for Learning

Fist to 5
Universal Design Origin

Movement in architecture

“Consider the needs of the broadest possible range of users from the beginning”
- Architect, Ron Mace

Examples of Universal Design?
Universal Design for Learning (UDL) Origin

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

David Rose
Paradigm Shift

Not to “fix” the child who has a problem
instead
“Fix” the curriculum (goals, methods, materials, and assessments) so that it can meet diverse learner needs
Universal Design for Learning

• A curriculum framework - **organized around 3 principles based on the learning sciences**

How UDL can provide **access for all**

– Integration of effective teaching strategies in inclusive classrooms to **reduce barriers** for students

• Flexible and supportive for all

• Decreases the barriers that limit access

• Based on brain research
Primary barrier to making expert learners of all students

- Inflexible, one-size-fits-all curricula
  - unintentional barriers to learning

Diversity is now the norm, not the exception
Why is UDL effective?

• Learning is unique to individuals
• Abilities are not fixed - continually shift and are in relationship to the environment
• Intersection between individual and environment
• An average student is mythical
• The learning brain has 3 main networks-
  recognition-what, strategic-how, affective-why of learning
Aoccdrnig to a rscheearch at Cmabrigde Uinsrtisy, it deosn't mtttaerin what oredr the ltteers in a word are, the olny iprmoetnt tihng is that the frist and lsat ltteer be at the rghit pclae. The rset can be a toatl mses and you can still raed it wouthit porbelm. This is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the word as a wlohe.

http://www.mrc-cbu.cam.ac.uk/people/matt.davis/home.html
UDL and the Learning Brain

Recognition networks: “the *what* of learning”

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

http://www.cast.org
UDL and the Learning Brain

Strategic networks: “the how of learning”

plan, execute, and monitor actions and skills

http://www.cast.org
UDL and the Learning Brain

Affective networks: “the why of learning”
evaluate and set priorities

http://www.cast.org
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

http://www.cast.org CAST©
Teaching Every Student in the Digital Age
PRINCIPLES OF THE UNIVERSAL DESIGN FOR LEARNING FRAMEWORK

• **Principle 1:**
  - To support recognition learning, provide *multiple, flexible methods* of *presentation/representation*.

• **Principle 2:**
  - To support strategic learning, provide *multiple, flexible methods* of *expression* and apprenticeship.

• **Principle 3:**
  - To support affective learning, provide *multiple, flexible options* for *engagement*. 
Identify barriers that slow progress

Discuss with someone near you – 3 minutes
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
Recent changes in technology:

• Make it possible to communicate with more people than ever before
• Enable learning any time, any place, any how
• Facilitate personalization
• Promote openness, which promotes sharing
• Promote participation in content, knowledge, and news production
• Enable collaboration across the world

BUT....
Technology alone cannot accomplish all

- New technologies and digital media hold enormous promise for ALL but especially those with exceptionalities
- To be effective, technology-based learning needs to take place within a universally designed curriculum
- Goals, assessments, methods, and materials support learning through multiple means of representation, expression and engagement
Why is UDL necessary?

The variance across individuals is the norm

Diversity is what makes us great

Need for personalized learning

Sir Ken Robinson
Questions???

15 Minute

BREAK
Review

Paradigm Shift?

Intervention?

Why?

Principles?
PRINCIPLES and GUIDELINES

Focused on teaching and learning

Handout
**Universal Design for Learning Guidelines**

I. Provide Multiple Means of Representation
- 1: Provide options for perception
  - 1.1 Offer ways of customizing the display of information
  - 1.2 Offer alternatives for auditory information
  - 1.3 Offer alternatives for visual information

- 2: Provide options for language, mathematical expressions, and symbols
  - 2.1 Clarify vocabulary and symbols
  - 2.2 Clarify syntax and structure
  - 2.3 Support decoding of text, mathematical notation, and symbols
  - 2.4 Promote understanding across languages
  - 2.5 Illustrate through multiple media

- 3: Provide options for comprehension
  - 3.1 Activate or supply background knowledge
  - 3.2 Highlight patterns, critical features, big ideas, and relationships
  - 3.3 Guide information processing, visualization, and manipulation
  - 3.4 Maximize transfer and generalization

II. Provide Multiple Means of Action and Expression
- 4: Provide options for physical action
  - 4.1 Vary the methods for response and navigation
  - 4.2 Optimize access to tools and assistive technologies

- 5: Provide options for expression and communication
  - 5.1 Use multiple media for communication
  - 5.2 Use multiple tools for construction and composition
  - 5.3 Build fluencies with graduated levels of support for practice and performance

III. Provide Multiple Means of Engagement
- 7: Provide options for recruiting interest
  - 7.1 Optimize individual choice and autonomy
  - 7.2 Optimize relevance, value, and authenticity
  - 7.3 Minimize threats and distractions

- 8: Provide options for sustaining effort and persistence
  - 8.1 Heighten salience of goals and objectives
  - 8.2 Vary demands and resources to optimize challenge
  - 8.3 Foster collaboration and community
  - 8.4 Increase mastery-oriented feedback

- 9: Provide options for self-regulation
  - 9.1 Promote expectations and beliefs that optimize motivation
  - 9.2 Facilitate personal coping skills and strategies
  - 9.3 Develop self-assessment and reflection

**Resourceful, knowledgeable learners**

**Strategic, goal-directed learners**

**Purposeful, motivated learners**
UDL and Digital Media

NIMAS

http://www.cast.org
### Planning for Academic Diversity

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receptive Language</td>
<td>Background Knowledge</td>
</tr>
<tr>
<td>Reading</td>
<td>Decoding</td>
</tr>
<tr>
<td>Ambulate</td>
<td>Gross Motor Skills</td>
</tr>
<tr>
<td>Expressive Language</td>
<td>Written Expression</td>
</tr>
<tr>
<td>Hard of Hearing</td>
<td>Deaf</td>
</tr>
<tr>
<td>Memory</td>
<td>Persistence</td>
</tr>
<tr>
<td>Problem Solving</td>
<td></td>
</tr>
<tr>
<td>Low Vision</td>
<td>Blind</td>
</tr>
</tbody>
</table>

*Dave Edyburn, 2008*
Common Academic Task and Instructional Challenges

• Read a chapter in a science textbook
  – Deficits in background knowledge
  – Below grade level reading skills
  – Poor fluency and comprehension skills
  – Difficulty with new vocabulary

Edyburn, 2008
Planning for Academic Diversity

Read a chapter in a science textbook
– Scan textbook
– Locate/create materials with audio support
  • StarChild
– Search for alternative text source materials
  • How Things Work, E-textbooks
– Search for alternative media materials
  • Qwiki
Planning for Academic Diversity

Instructional Support, Organization, Memory, Accessibility

- iPad
- KidRex
- Internet4Classrooms
- 42Explore
- Teach with technology
- Digital History
- Digital Universe
- Learning through Listening
- Kathy Schrock’s Guide for Educators
- Text-to-Speech
- Public domain literature in audio format
- Speech generation – Boardmaker Voice recognition – Dragon Naturally Speaking
- netTrekker
- Eduscapes
Planning for Academic Diversity

Solve multi-step math problems

- Traditional chalkboard/paper/pencil
  AND/OR
  - Calculation Support
    - WebMath
  - Conceptual Support
    - Virtual Math Manipulatives
  - Visual Support
    - iKnowThat Leon Math Movies
Effective flexible technologies

- Wikis
- Podcasting
- Google Docs
- Smartboard
- Wordle
- Bubbl.us
- Time for Kids
- Brain Pop
- Blog (http://jmundorf.edublogs.org)
Accessibility in front of us

- **Microsoft Partners in Learning**
  - Free for Educators
- **Accessibility for Every Student**
- **WatchKnowLearn**
- **Academic Skill Center**
  - Educational Videos
- **Free technology for Teachers**
- **Hundreds of Apps**
Windows XP TTS

- To preview the Text-to-Speech voice, follow these steps:
- Click **Start**, click **Control Panel**, and then double-click **Speech**.

On the **Text-to-Speech** tab, the displayed name in the **Voice selection** drop-down list is the active voice.

- Click **Preview Voice** to hear the currently selected voice. The text is spoken and the words are highlighted as they are spoken.
- During playback, **Preview Voice** will change to **Stop**. Click **Stop** to interrupt the voice playback.
- **NOTE**: You can change the text to be read by the **Preview Voice** by highlighting the text and typing in **new** text. These changes are not permanent and when you reopen **Speech** properties or select a different voice, the text will reset to the default.
- The text-to-speech feature in **Microsoft Word** can be convenient and fun to use. Word 2007 is unique from previous versions in that it does not have an explicit text-to-speech feature.
Word 2010

• Add Speak to the Quick Access Toolbar
  You can add the Speak command to your Quick Access Toolbar by doing the following:
  • Next to the Quick Access Toolbar, click Customize Quick Access Toolbar.
  • Click More Commands.
  • In the Choose commands from list, select All Commands.
  • Scroll down to the Speak command, select it, and then click Add.
  • Click OK.
  • When you want to use the text-to-speech command, click the icon on the Quick Access Toolbar.

• Convert text to speech
  After you have added the Speak command to your Quick Access Tool, you can hear single words or blocks of text spoken by highlighting the text you want to hear, and then clicking the Speak command.
Insert a voice comment in Word 2007

- Display the Reviewing toolbar: From the View menu, choose Toolbars and then select Reviewing; or right-click the background of any toolbar and select Reviewing.

- If the Insert Voice icon isn’t visible, add it: Click the Reviewing toolbar’s drop-down arrow (at the right end) and choose Add Or Remove Buttons. Then, select Reviewing and select Insert Voice. In Word 2007, click the Office button and then click Word Options. Select Customize and then select Commands Not In Ribbon from the Choose Commands From drop-down list. Select Insert Voice and click Add and then click OK.

- After you add the Insert Voice button, you’re ready to record a comment. Position your cursor where you want to insert the comment or highlight a word or phrase if you want to attach the comment to content.

- Click the Insert Voice button.

- When Word displays the Sound Object dialog box (which seems to take a while the first time), click the Record button (that’s the red button at the right end).

- Start talking.

- When you’re finished, click Stop (that’s the rectangle to the left of the Record button).

- Close the Sound Object dialog box.

- Word will insert a comment balloon that looks just like any other comment. However, instead of text, the comment
Universal Design for Learning Guidelines

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      1.3 Offer alternatives for visual information
   2: Provide options for language, mathematical expressions, and symbols
      2.1 Clarify vocabulary and symbols
      2.2 Clarify syntax and structure
      2.3 Support decoding of text, mathematical notation, and symbols
      2.4 Promote understanding across languages
      2.5 Illustrate through multiple media
   3: Provide options for comprehension
      3.1 Activate or supply background knowledge
      3.2 Highlight patterns, critical features, big ideas, and relationships
      3.3 Guide information processing, visualization, and manipulation
      3.4 Maximize transfer and generalization

II. Provide Multiple Means of Action and Expression
   4: Provide options for physical action
      4.1 Vary the methods for response and navigation
      4.2 Optimize access to tools and assistive technologies
   5: Provide options for expression and communication
      5.1 Use multiple media for communication
      5.2 Use multiple tools for construction and composition
      5.3 Build fluencies with graduated levels of support for practice and performance

III. Provide Multiple Means of Engagement
   7: Provide options for recruiting interest
      7.1 Optimize individual choice and autonomy
      7.2 Optimize relevance, value, and authenticity
      7.3 Minimize threats and distractions
   8: Provide options for sustaining effort and persistence
      8.1 Heighten salience of goals and objectives
      8.2 Vary demands and resources to optimize challenge
      8.3 Foster collaboration and community
      8.4 Increase mastery-oriented feedback
   9: Provide options for self-regulation
      9.1 Promote expectations and beliefs that optimize motivation
      9.2 Facilitate personal coping skills and strategies
      9.3 Develop self-assessment and reflection

Resourceful, knowledgeable learners
Strategic, goal-directed learners
Purposeful, motivated learners

Systematic Change template
Principle I. 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

Source URL: http://www.udlcenter.org/implementation/examples
Principle II. Provide Multiple Means of Action and Expression

Guideline 4: Provide options for physical action
• Checkpoint 4.1: Options in the mode of physical response

Guideline 5: Provide options for expressive skills and fluency

Guideline 6: Provide options for executive functions

Source URL: http://www.udlcenter.org/implementation/examples
Principle III. Provide Multiple Means of Engagement

Guideline 7: Provide options for recruiting interest

• Checkpoint 7.1: Options that increase individual choice and autonomy

Guideline 8: Provide options for sustaining effort and persistence

Guideline 9: Provide options for self-regulation

Source URL: http://www.udlcenter.org/implementation/examples
UDL Wheel

http://udlwheel.mdonlinegrants.org/

Maryland State dept. of Education
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.

Video
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.
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
Getting from Here to There

UDL, Global Positioning Systems, and Lessons for Improving Education

http://www.udlcenter.org/resource_library/articles/gps
UDL is on the map in Washington

“Transforming Education”

“Systemic Change”

• U.S. Secretary of Education highlights UDL
  – Letter to Congress

“The model of learning described in this plan calls for engaging and empowering personalized learning experiences for learners of all ages. The model stipulates that we focus what and how we teach to match what people need to know and how they learn. It calls for using state-of-the-art technology and Universal Design for Learning (UDL) concepts to enable, motivate, and inspire all students to achieve, regardless of background, languages, or disabilities. It calls for ensuring that our professional educators are well connected to the content and resources, data and information, and peers and experts they need to be highly effective. And it calls for leveraging the power of technology to support continuous and lifelong learning.”
The U.S. Congress, in the Higher Education Opportunity Act (HEOA; Public Law 110-315, August 14, 2008)

- TIED FUNDING FOR TEACHER PROFESSIONAL development and preservice education to UDL implementation.

UDL was defined by the HEOA as:
- a scientifically valid framework for guiding educational practice that -
  - (A) provides flexibility in the ways information is presented, in the ways students are engaged; and
  - (B) reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient.
CEC Member Brings UDL to the Senate!

For the past few years, George Van Horn, Special Education Director at the Bartholomew Consolidated School Corporation (BCSC) in Columbus, Indiana and current Indiana CEC President has implemented a Universal Design for Learning (UDL) framework across the district. As a result, BCSC has lowered its number of students eligible for special education, eliminated many discipline issues and seen student achievement gains. This week, U.S. Senator Tom Harkin (D-IA), highlighted the district’s accomplishments during a hearing in before the Health, Education, Labor and Pensions Committee in the Senate.

The Senate hearing, entitled The Promise of Accessible Technology: Challenges and Opportunities, featured four speakers, including the Superintendent of BCSC, Dr. John Quick. Dr. Quick explained that UDL is a set of principles for curriculum development that give all individuals equal opportunities to learn. Dr. Quick described how the district worked for years to implement UDL and how it incorporated technology into its student's lives. He discussed the importance of student engagement and project-centered learning.

Moreover, he emphasized the point that although UDL specifically benefits students with disabilities, it benefits all students in the district and is used to help everyone better access knowledge and demonstrate learning growth. Training for professionals working in the schools is essential and in BCSC all teachers undergo a three day UDL workshop at the beginning of the year to ensure they can fully integrate UDL throughout their practice.

The gains the district has seen are real and continuing. CEC applauds George Van Horn, Dr. Quick and BCSC on their hard work and success with students. This is just another example
• States and provinces across the US and Canada 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
National Direction

UDL has been in the Higher Education Opportunity Act since 2008 - making college more accessible and enhancing teacher preparation programs.

UDL is defined in IDEA 2004 and the Assistive Technology Act of 1998.

National Education Technology Plan

The Common Core State Standards Initiative endorses UDL as a way to improve access to standards-based learning for all students.

National UDL Task Force
• Fact sheets, Briefs, Videos
Respondents reported that their states are attempting to make UDL a priority. The vast majority of respondents (12 out of 13) indicated that they viewed UDL as a state priority that was equally or more important to other state education-related priorities.
Missouri Highlights

State Documents that Mention UDL or UD

• UD mentioned in Race to the Top application specifically targeting high-quality assessment

Other Activities

• Whitepaper from Missouri State University: Commitment to Universal Design at Missouri State University

• Governing state of the Partnership for Assessment of Readiness for College and Careers (PARCC) consortium - committed to developing assessments that adhere to UD principles

http://www.udlcenter.org/advocacy
RTI and UDL share the objective of improving educational outcomes

• Both RTI and UDL
  – 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 student
  – 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 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
Anticipate Differences

- Fundamental characteristic of UDL

- **Plan** for instruction for students who may be non-verbal, cognitively impaired, blind, deaf, struggling readers, reluctant writers, unmotivated, non-native English speakers, or gifted/talented.

- Rather than creating a single instructional plan (i.e., one size fits all curriculum), plan a **variety** of learning activities to enable all students to achieve the given goals in the time allocated for instruction

  Tic-tac-toe
Implementing UDL
Teaching and Learning

- Designers of learning environments
- Facilitators of learning

Technology Changes Instructional Design

- From instruction to discovery
- From individual to collaborative learning
- From broadcast to interactive learning
- From teacher-centric to student-centric

CAST is a nonprofit education R&D group best known for defining and promoting the innovative concepts of Universal Design for Learning (UDL).

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

1) **UDL Goal Setter**
   
   You learn to analyze what is essential to a goal and what can be changed and varied to support different learners.

2) **UDL BookBuilder** ([http://bookbuilder.cast.org](http://bookbuilder.cast.org)) 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.

3) **CAST Strategy Tutor** ([http://cst.cast.org/](http://cst.cast.org/)) offers adolescent readers and their teachers customizable mentoring and support as they conduct Internet research and read websites.

4) **UDL Lesson Builder** ([http://lessonbuilder.cast.org](http://lessonbuilder.cast.org)) is a free online tool that helps educators build options and supports into their lessons to reach and engage all students.

5) **UDL Curriculum Self-Check** ([http://udlselfcheck.cast.org/](http://udlselfcheck.cast.org/)) provides an interactive tool to help educators identify areas of the curriculum where barriers may exist or more supports for diverse learners are needed.
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      5.2 Use multiple tools for construction and composition
      5.3 Build fluencies with graduated levels of support for practice and performance
   6: Provide options for executive functions
      6.1 Guide appropriate goal-setting
      6.2 Support planning and strategy development
      6.3 Facilitate managing information and resources
      6.4 Enhance capacity for monitoring progress

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Resourceful, knowledgeable learners
Strategic, goal-directed learners
Purposeful, motivated learners

MITS handout
Systematic Change template
Brainstorm Solutions to Barriers

Discuss & Share – 5 minutes
On the Horizon

- Tablets
- Ipads
- Smartphones
- APPS
- The Flipped Classroom

Leaders need to be instrumental in providing resources
Digital Media: New Learners of the 21st Century

– A documentary that examines how mobile devices and digital media practices can empower young people to direct their own learning.

• Short Clip
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
Handouts

• Q & A for Educators

• Q & A for Families

• What Teachers Need in a UdL Environment
Taking Action

Action Steps

Develop Action Steps that address the essential question: What is the essential question?

- Idea I want to implement
- Benefits of implementation
- What does success look like?
- Possible Barriers
- Possible Solutions
- Needed Resources
- Timeline
Where Do I Go From Here?  
Resources

CAST – Center for Applied Special Technology

National Center on Accessing the General Curriculum

Access Center

Free technology Toolkit for UDL in ALL Classes

IRIS Center - UDL
• What did I learn?

• Why did I learn it?

• How can I use it?
UNIVERSAL DESIGN FOR LEARNING

Is

Instructional design grounded in effective teaching practices
Maxwell Maltz, author of Psycho-cybernetics

“It takes 21 days to form a habit.”

Thank you

http://cstl-coe.semo.edu/naguinaga/