Online Learning: Meeting the Needs of the Diverse Learner
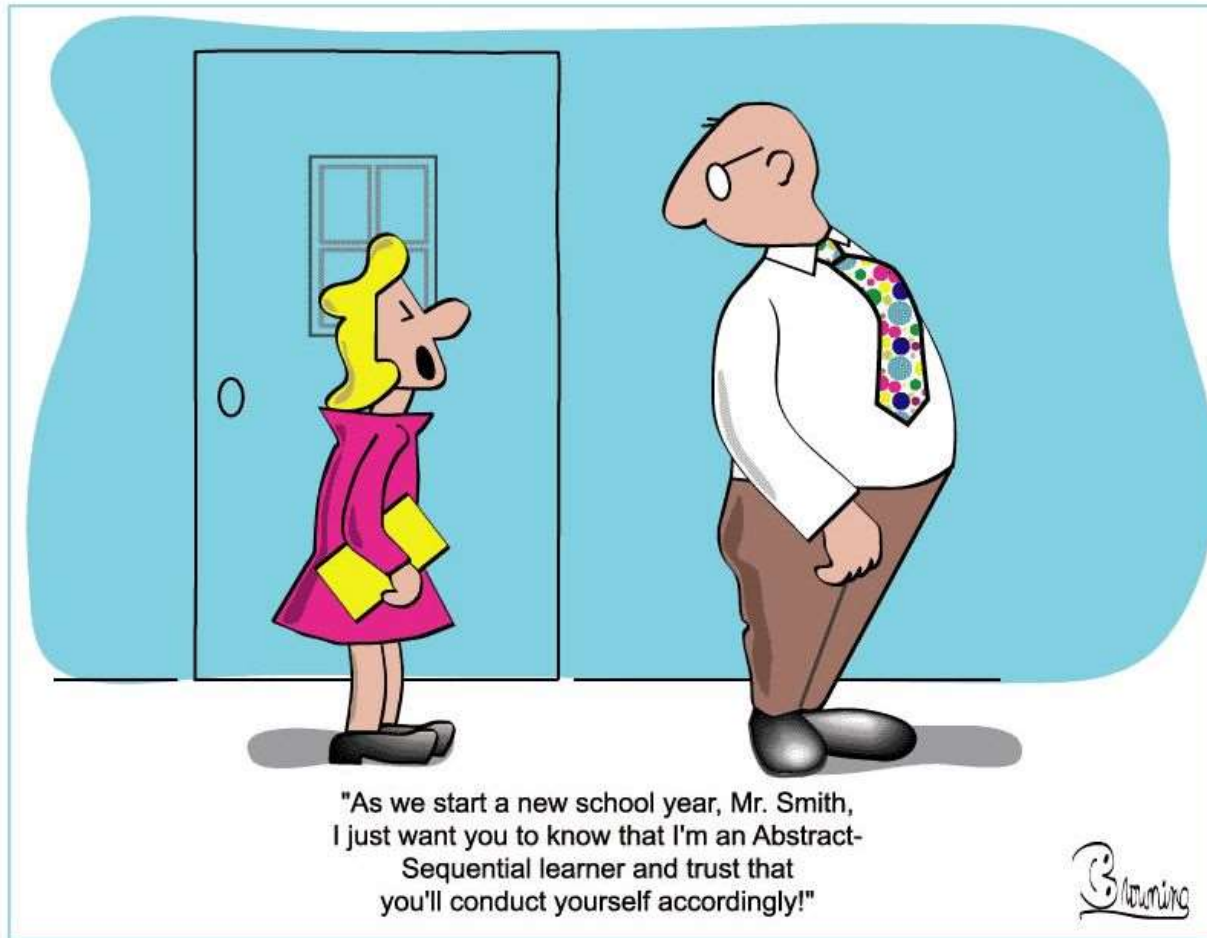
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Learning is not strictly a cognitive process;
it is a profoundly socially
and culturally mediated one.

-M. Gauvain

Online Learning Statistics – Students with Disabilities

- Students with disabilities increasingly choose to participate in online courses at a higher rate than non-disabled students (Cavanaugh et al., 2013; Alamri & Tyler-Wood, 2013)

- Post-secondary: no significant difference in learning and achievement between students with disabilities and non-disabled students (Allday and Allday 2011)

- Almost half of virtual schools characterized the majority of students served as "high risk" … in 2011 (Stalker, iNACOL)

- 38 states don't have clear OLL policies for students with disabilities (Equity Matters, 2016)

Why Online?

- Path, pace, time & place

- Greater sense of control and academic self-efficacy
  - Flexibility
  - Less stress managing disability and education
  - Reduced stigma and rejection

- The hope of experiencing education without barriers

- Personalized programming

- Bullying

Online Instruction: How We Got Started

- PowerPoint with narration

- Documents converted in to online text

- Graphics, photos and videos

- Assessment tool makeovers

- Asynchronous learning…

Issues

- Basic skills
  - Focus on increasing content knowledge
  - Forget about teaching the learning process – process knowledge
  - Social learning is missing

- Structural Accessibility
  - Sensory Based and Physical Accessibility
  - Equipment, bandwidth, teacher knowledge

- Cognitive Accessibility
  - Online programs assume students navigate the content *and* structure their learning environment
  - Scaffolding to support cognitive load demand

Process Knowledge

- The skills students learned from instruction or an activity

- Habits of work

- Example: Communication

- Example: Collaboration

- Barriers:
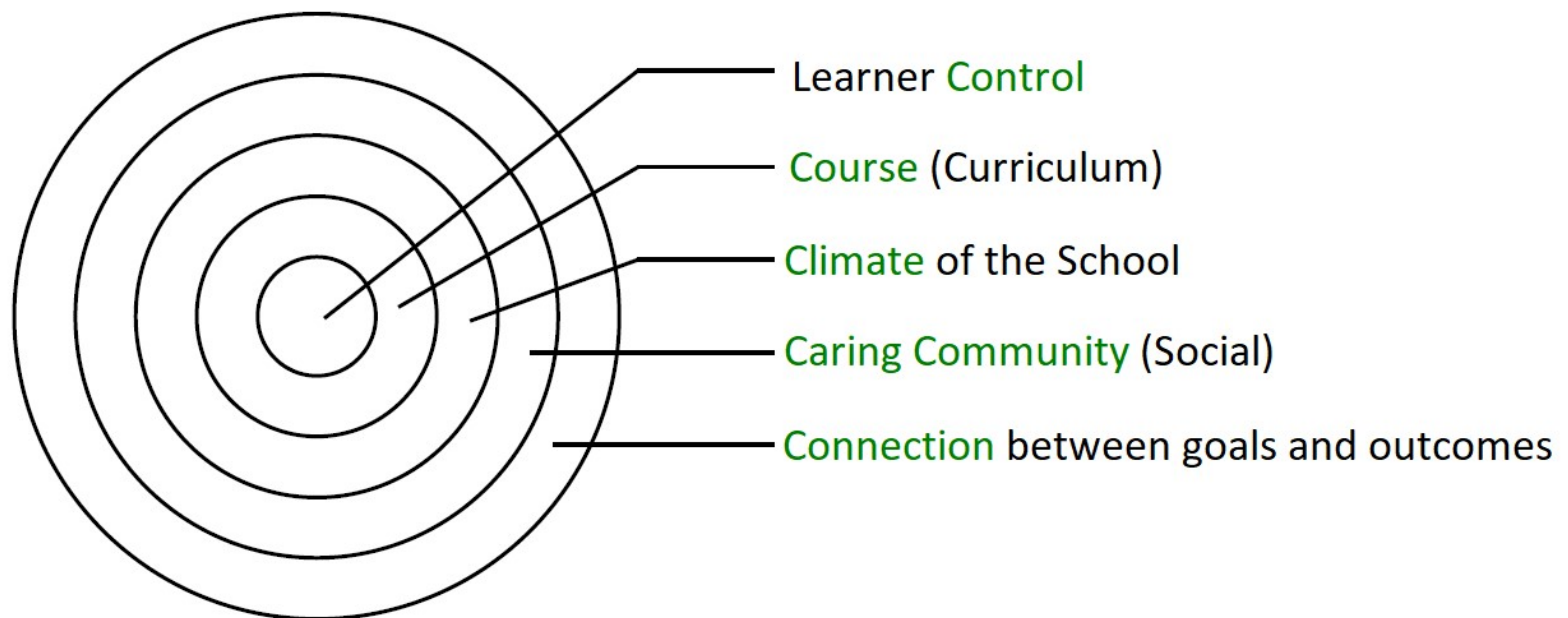 - Cognitive accessibility
  - Cognitive load

Cognitive Accessibility

- When the usability of an activity or tool bumps in to ability (language acquisition, disability)

- Barriers: attention, executive functioning, knowledge, language, literacy, memory, perception and reasoning

- Reduced when cognitive load is impacted by a barrier

- Consider stage, not age

Online Learning Best Practices: EL and Disability

- 5 C's of Engagement

- Foundations:
  - Student satisfaction
  - Student success
  - Design from the beginning
  - Competency based

5 C's of Student Engagement: School

Learner **Control**

Course (Curriculum)

Climate of the School

Caring Community (Social)

Connection between goals and outcomes

Repetto et al., 2010

Online Learner Satisfaction

- One of five factors considered to determine online effectiveness
  - Learning effectiveness, access, faculty satisfaction, school cost-effectiveness, student satisfaction

- Equal satisfaction between modalities (Yen, Lo, Lee & Enriquez, 2018)
  - Online, face to face, blended

- Community of Inquiry Framework

Satisfaction: Community of Inquiry

- Cognitive presence
  - Students construct and assign meaning through reflection and problem solving

- Teaching presence
  - Structure
    1. Course design
    2. Facilitation: being present and guiding students through learning activities

- Social presence
  - The degree to which students feel connected to each other
  - Creates a social space: collaborative community that supports interaction (relationship), engagement, & active learning – reducing isolation
  - Teacher and peer relationships needed to build knowledge and improve self-regulation

Satisfaction: Social presence

- Identifying with a learning community – group identity and collaboration

- Trusting environment >> open communication >> positive learning environment and risk-free expression

- Development of relationships >> expression of emotions and meaningful interactions

- Build long term bonds with students and teachers

- Positive correlation with student satisfaction

Satisfaction: Relationships

- Impacts learning and motivation

- Student-content interactions
  - Predictable
  - Multiple means of representation, expression, and engagement with content

- Student-teacher interactions
  - Millennial online learners more dependent on relationship with online instructor
  - Student/family-teacher relationships + explicit direct instruction = increased achievement (Equity Matters, 2016)

- Student-student interactions
  - GenZ learners want more collaborative learning interactions

Online Learner Success: Student

- Related to six areas:
  - The online environment
  - School and home/personal supports
  - Inner strength and resiliency
  - Self-determination (transition)
  - Motivation to succeed
  - Goal commitment (self-driven IEPs)
- Persistence

Factors Influencing Student Persistence

- Peer and/or family support

- Student satisfaction with online learning

- Time management skills

- Sense of belonging to a learning community

- Increased communication with the teacher

Least teacher control

Most teacher control

Online Learner Success: School

- **Communication and relationship with the teacher**
  - Effectiveness v. efficiency

- Course organization
  - Structure
  - Student input

- Information presentation

- Opportunities to work together and interact

- Timely and meaningful feedback

Online Learner Success: School

- Communication and relationship with the teacher

- Course organization

- Information presentation

- Opportunities to work together and interact

- Timely and meaningful feedback

- **Student to student interaction**

= *ENGAGEMENT*

Best Practice: The Teacher Factor

- The online teacher plays one of the biggest roles in student success
  - Asset based learning
  - Connecting content to skills your students see as necessary
  - Facilitating student interests and learning

- Looping
  - Social presence and the long term bond
  - Monitor and adjust

- Know the technology
  - AT goes unused because teachers can't use it or support it
  - Problem solve access issues to accommodate
  - Scaffolding throughout the course
  - Give students the power

Best Practice: Course Design

- Consistent
  - Perceptibility: can perceive the design, regardless of sensory abilities
  - Operability: student can use the design, regardless of physical ability

- Support language, literacy, executive function
  - Multiple forms of resources: **video & audio paired with text**
  - **Academic language: vocabulary instruction & supports**
  - **Scaffolding**

- Activities that provide
  - Concrete experience
  - Metacognition
  - Application
  - Active Experimentation (Kolb, Experiential Learning Theory)
  - Consistent, built in supports throughout
  - Student design

Nine Types of Curriculum Adaptation

- Quantity

- Time

- Level of Support

- Input

- Difficulty

- Output

- Participation (engagement)

- Alternate Goals

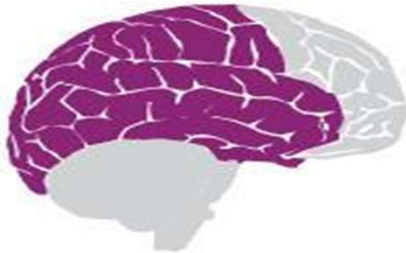- Functional Curriculum

Universal Design for Learning

- Asset Based

- Authentic Learning
  - Multiple sources and modalities
    - Collaborative learning
    - Metacognition
    - Interdisciplinary thinking
  - Multiple expression
  - Engaging
    - Real world problems
    - Personalized

Universal Design for Learning

Recognition Networks
The "what" of learning

How we gather facts and categorize what we see, hear, and read. Identifying letters, words, or an author's style are recognition tasks.
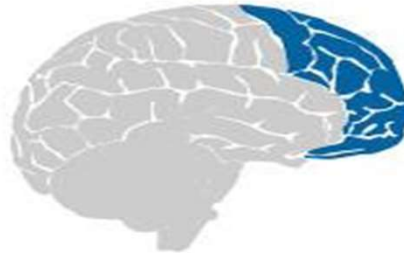
☑ Present information and content in different ways

More ways to provide Multiple Means of Representation

Strategic Networks
The "how" of learning

Planning and performing tasks. How we organize and express our ideas. Writing an essay or solving a math problem are strategic tasks.

☑ Differentiate the ways that students can express what they know

More ways to provide Multiple Means of Action and Expression

Affective Networks
The "why" of learning

How learners get engaged and stay motivated. How they are challenged, excited, or interested. These are affective dimensions.

☑ Stimulate interest and motivation for learning

More ways to provide Multiple Means of Engagement

Source: CAST - What is UDL? (http://www.cast.org/research/udl)

Universal Design for Learning Guidelines

I. Provide Multiple Means of Representation	II. Provide Multiple Means of Action and Expression	III. Provide Multiple Means of Engagement
1. Provide options for perception • Options that customize the display of information • Options that provide alternatives for auditory information • Options that provide alternatives for visual information	**4. Provide options for physical action** • Options in the mode of physical response • Options in the means of navigation • Options for accessing tools and assistive technologies	**7. Provide options for recruiting interest** • Options that increase individual choice and autonomy • Options that enhance relevance, value, and authenticity • Options that reduce threats and distractions
2. Provide options for language and symbols • Options that define vocabulary and symbols • Options that clarify syntax and structure • Options for decoding text or mathematical notation • Options that promote cross-linguistic understanding • Options that illustrate key concepts non-linguistically	**5. Provide options for expressive skills and fluency** • Options in the media for communication • Options in the tools for composition and problem solving • Options in the scaffolds for practice and performance	**8. Provide options for sustaining effort and persistence** • Options that heighten salience of goals and objectives • Options that vary levels of challenge and support • Options that foster collaboration and communication • Options that increase mastery-oriented feedback
3. Provide options for comprehension • Options that provide or activate background knowledge • Options that highlight critical features, big ideas, and relationships • Options that guide information processing • Options that support memory and transfer	**6. Provide options for executive functions** • Options that guide effective goal-setting • Options that support planning and strategy development • Options that facilitate managing information and resources • Options that enhance capacity for monitoring progress	**9. Provide options for self-regulation** • Options that guide personal goal-setting and expectations • Options that scaffold coping skills and strategies • Options that develop self-assessment and reflection

Universal Design for Learning

- Accessibility Tips:
    - Videos and audio: Closed Caption & transcripts with timing
    - Use RTF (Avoid PDFs)
    - Multimedia with words and pictures *with consistent design*
    - Text-only alternative pages with descriptions of images (or image alt. text)
    - High contrast between background color and font color; consist use of font and color
        - Increases visibility & decreases cognitive load
        - Heading structure (Word)
    - UDL Wheel: http://www.udlcenter.org/sites/udlcenter.org/files/UDL%20DIY%20Figure.pdf
    - Read&Write Google, SnapVerter – built in tools

UDL Scan Tool

- Examine the alignment of online content student cognitive and learning needs

- UDL Scan Tool:
  - http://www.centerononlinelearning.res.ku.edu/
  - Google Form & Analysis Template
  - How to videos

VPAT

- Voluntary Product Accessibility Template

- Analysis of K-12 online learning technologies on company websites

- Uses Section 508 standards for physical and sensory accessibility

- Example:
  - Desire2Learn
  - Garage Band
  - Soft Chalk
  - Edmentum

- VPAT website: http://www.centerononlinelearning.res.ku.edu/vpat/

Best Practice: Competency Based Instruction

- Focus on stage, not age

- Student driven goals and instruction

- Fuzzy situations

- Collaborative

- Asset based

Example: Self-Regulated Strategy Development

- Background knowledge

- Purpose and benefits

- Modeling

- Memorize the steps using mnemonics – thinking aloud

- Support strategy acquisition with scaffolding
  - Reduce the cognitive load: distributed between the student and technology
  - Gradual release of responsibility

- Provide independent practice

Example: Teaching Writing

- Explicit instruction

- Open ended writing

- Ability to write collaboratively

- Infused AT to support writing
  - Google Docs
  - Google Read & Write – highlight, text structure more apparent

- Built in structural supports

Example: Goal Based Scenarios

- Type of assignment

- Student takes steps to accomplish the goal (assignment)

- GBS 7 essential elements:
  1. Learning goals/lesson objectives
     - Content knowledge & process knowledge
  2. Mission: what are students actually going to be doing?
  3. Cover story: motivating story that explains the need & motivation for completing the mission
  4. Role
  5. Scenario Operations: all activities that the student must do to complete the mission
  6. Resources: information sources available
  7. Feedback: formative and summative

Other Resources

- Center for Online Learning and Students with Disabilities
  - http://www.centerononlinelearning.res.ku.edu/

- VPAT – access based focus on text, color, mark-up language and web features

- IRIS Module: UDL introduction
  - https://iris.peabody.vanderbilt.edu/module/udl/

- Tech 15
  - YouTube Channel demonstration apps and tech used in teaching

Other Resources

- UDL Guidelines
  - http://udlguidelines.cast.org/?utm_medium=web&utm_campaign=none&utm_source=udlcenter&utm_content=site-banner

- CAST: Center for Applied Special Technology
  - CAST Book Builder: http://bookbuilder.cast.org/
  - UDL Exchange: http://udlexchange.cast.org/home

- National Center on Accessible Educational Materials
  - http://aem.cast.org/about#.W150z9JKg2w

Additional Sources

- Alamri & Tyler-Wood (2017). Factors Affecting Learners with Disabilities – Instruction Interaction in Online Learning.

- Baharin, Lateh, Hurhudzaifah mohd Nawai & Nathan (2014). Evaluation of Satisfaction Using Online Learning with Interactivity.

- Basham, Smith & Satter (2016). Universal Design for Learning: Scanning for Alignment in K-12 Blended and Fully Online Learning Materials.

- Barbera, Clara & Linder-Vanberschot (2013). Factors Influencing Student Satisfaction and Perceived Learning in Online Courses.

- Britt (2015). How to better engage online students with online strategies.

- Burke, Clapper & McRae (2016). Accessible Online Instruction for Students with Disabilities: Federal Imperatives and the Challenge of Compliance.

- Cavanaugh, Repetto, Wayer, & Spitler (2013). Online Learning for Students with Disabilities: A Framework for Success.

- Center for Online Learning and Studies with Disabilities (2016). Equity Matters 2016.

- CompetencyWorks (2018). Meetings Students Where They Are.

- Evergreen Education Group (2016). Keeping Pace with K-12 Online Learning.

- Harvey, Parahoo & Santally (2017). Should Gender Differences be Considered When Assessing Student Satisfaction in Online Learning Environment for Millennials?

- Hashey & Stahl (2014). Making Online Learning Accessible for Students with Disabilities.

Additional Sources

- Ke & Kwak (2013). Online learning across ethnicity and age: A student on learning participation, perception, and learning satisfaction.

- Kurucay & Inan (2017). Examining the effects of learner-learner interactions on satisfaction and learning in an online graduate course.

- Serianni & Coy. Doing the Math: (2014). Supporting Students With Disabilities in Online Courses.

- Stokes, Gillan & Braden (2016). Establishing the link between usability and student satisfaction in online learning.

- Straub & Vasquez. (2015). Effects of Synchronous Online Writing Instruction for Students with Learning Disabilities.

- Varonis (2015). From barriers to bridges: approaching accessibility in course design.

- Verdinelli & Kutner (2016). Persistence Factors Among Graduate Students With Disabilities.

- Weidlich & Bastiaens (2017). Explaining social presence and quality of online learning with the SIPS model.

- Yen, Lo, Lee & Enriquez (2017). Learning online, offline and in-between: comparing student academic outcomes and course satisfaction in face-to-face, online and blended teaching models.

- Zhan & Mei (2013). Academic self-concept and social presence in face-to-face and online learning.