Cognitive Diversity and Workplace Performance

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- Graduate Medical Education
- Stanford Health Care
Padlet Questions (10 minutes)

◦ STICKY NOTE 1: Define what cognitive diversity or learner variability means to you.
◦ STICKY NOTE 2: Give an example of a challenge you face in teaching and supervising someone.
◦ STICKY NOTE 3: What resources or ideas do you share with struggling graduate students or residents?
Go to Padlet or (Use Paper Sticky)
DISCUSSION OF RESPONSES
(10 MINUTES)
WHAT DOES COGNITIVE DIVERSITY REALLY LOOK LIKE?
Using your phone:

- My goal for you:
  - Map your way from 401 Quarry Rd. Palo Alto, CA to 725 Welch Rd. Palo Alto, CA.

- Requirements:
  - Use your smartphone the way you usually would.
  - You have no more than 3 minutes to map the directions.
  - You may leave the room to accomplish the goal.
DIVERSITY ENCOMPASSES A BROAD RANGE OF LEARNERS WHO PROCESS INFORMATION IN A MYRIAD OF WAYS AND PLACES.
Where and how does it show up?
Home, School, Work: How

Executive Functions

Planning and Organizing

Time Management

Initiation and Task Persistence

Active Reading, Writing, Math

Emotions

Self-Efficacy, Mind Set, Motivation

Working Memory, Attention & Processing Speed

Prioritize
Cognitive diversity really includes:

<table>
<thead>
<tr>
<th>Race</th>
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<tr>
<td>Culture</td>
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<tr>
<td>First Generation</td>
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<tr>
<td>Low income</td>
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<tr>
<td>Non English speakers</td>
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<tr>
<td>Gender</td>
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<tr>
<td>Neurodiverse populations: Learning Disabilities: Dyslexia, Dysgraphia, Dyscalculia, ADHD, Autism Spectrum</td>
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<tr>
<td>Mental health: anxiety and depression</td>
</tr>
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<td>Veterans, refugees, PTSD</td>
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Why?
The Changing Education Landscape

Populations are increasingly diverse with unique needs: 37% are first time college goers, 42% people of color and 9% first generation immigrants.*

Mental health concerns on campus are growing: PTSD, depression and anxiety all impact the brain.

Administrators are responding to diverse student needs and the 21st century workforce, while facing increasing competition from new forms of educational preparation.

Serious issues of retention and completion in many programs exist.

Lack of demonstrable learning gains for too many graduates with increasing cost and debt for learners are growing.

Source* https://www.luminafoundation.org/todays-student/

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Socio-emotional Factors in Learning

01
Work from mentoring research suggests that the most powerful contribution of a mentor is when a person sees “someone like me” and that provides a sense of belonging.

02
Research on depression, anxiety, PTSD and loneliness indicates that these emotions negatively impact working memory, attention and processing information.
Oh, crap! Was that TODAY?
I forgot everything.

So now I just stand here.
**Stereotype Threat**

- Stereotype threat is believed to contribute to race-and gender-based achievement gaps.

- In their studies, Steele and Aronson found that situational factors—more than individual personality or other characteristics—can strengthen or weaken the stereotype-threat effect.

- Many questions remain about the cognitive mechanisms behind stereotype threat, and subsequent research has focused on three factors: stress, performance monitoring, and efforts to suppress negative thoughts and emotions.
### Recommendations to Reduce Stereotype Threat

<table>
<thead>
<tr>
<th>Training and encouraging</th>
<th>Fostering</th>
<th>Embracing and celebrating</th>
<th>Communicating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training and encouraging educators to maintain high learning expectations for all students, regardless of race, gender, socioeconomic status, or perceived ability.</td>
<td>Fostering positive and supportive school and classroom cultures, which includes strong and trusting relationships among students and between teachers and students.</td>
<td>Embracing and celebrating, rather than ignoring, student diversity in educational settings, and cultivating the perception that diversity is an educational asset that provides benefits to all students.</td>
<td>Communicating to students the belief that they are capable of achieving at high levels, even while giving critical feedback on their work.</td>
</tr>
</tbody>
</table>
The process of working memory.

Illustration by Sarah Riazati & Mike Bamford
www.learnnc.org
Kind of thinking we often expect as learners/mentors:

- Systematically [organization]
- Linearly [organization]
- Recall math facts [memory]
- Self-monitor [metacognition]
- Move between operations [shift flexibly]
  - We have to scaffold this thinking when it’s not present
The Reality for Many
COGNITION:
Consider cognition in relation to your methods and materials.

Cognitive processes underlie what we do and expect. We all fall somewhere on the continuum for each process.

Extremes in one or more processes usually result in a diagnosed learning disability. Frequency and severity

These variations require us to consider how instruction and materials can be barriers to learning.
What We Need to Scaffold: The Science

- Executive Functions
- Active Reading, Writing, Math
- Emotions
- Self-Efficacy, Mind Set, Motivation
- Working Memory, Attention & Processing Speed

- Planning and Organizing
- Time Management
- Initiation and Task Persistence
- Prioritize
Predictive factors of success in higher ed and the workforce

- Academic and cultural capital
- Self-efficacy and role models
- Executive functioning:
  - Planning
  - Organizing
  - Starting and Completing a task
  - Shifting thinking
  - Time management
- Learning strategies
- Psychological factors
- Self awareness and self regulation
- Emotional regulation

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there is no average brain
KEEP CALM
this requires a
PARADIGM SHIFT
Definition of UDL

Universal Design for Learning is a framework to improve and optimize teaching and learning by rethinking the environment.
Neurological Foundation of UDL: Networks of the Learning Brain

Affective
The “Why”

Recognition
The “What”

Strategic
The “How”
Purposeful, proactive teaching and learning aligned with brain science (see handout)

UDL Principles

Provide multiple means of Engagement
Affective Networks
The "WHY" of learning

Provide multiple means of Representation
Recognition Networks
The "WHAT" of learning

Provide multiple means of Action & Expression
Strategic Networks
The "HOW" of learning
Purposeful, proactive teaching and learning aligned with brain science

UDL Principles

Provide multiple means of Engagement
- Affective Networks
  - The "WHY" of learning

Provide multiple means of Representation
- Recognition Networks
  - The "WHAT" of learning

Provide multiple means of Action & Expression
- Strategic Networks
  - The "HOW" of learning

Expert Learners who are...
- Purposeful & Motivated
- Resourceful & Knowledgeable
- Strategic & Goal-Directed
Analyze the Teaching and Learning Environment

Knowledge
What are the essential concepts?
What is inclusive? Exclusive?

Instruction
How can the concepts be taught?
What are the desired outcomes?

Learning
What are some ways the learner can process information and express the outcomes?
Sample Solutions for Barriers to Success

- Videos with CC
- Text to speech
- Videotape
- Smartpens
- Speech to text as a tool to write
- Notes uploaded to computer with voice output
- Routinely use 14-pt font
Universal Design for Learning Guidelines

Provide Multiple Means of Engagement
- Purposeful, motivated learning
- 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 demands and resources to optimize challenge

Provide Multiple Means of Representation
- 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

Provide Multiple Means of Action & Expression
- 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
  + Support delivery of ideas in multiple ways

SEE HANDOUT
Group Activity

Step 1: In small groups, pairs or on your own identify one of the scenarios from Sticky note #2 of the opening exercise. (5 minutes)

Step 2: Brainstorm ways to provide multiple means of representation when you approach this topic for discussion. (15 minutes)

Step 3: Enter your results on an orange sticky note or the blank UDL guideline sheet provided to you. (3 minutes)

Step 4: Share out (10 minutes)
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Think About Teaching and Learning in your Environment

- Do committees exist that review teaching and learning?
- Is faculty development available?
- What resources are available to students?
- What is the climate on campus for “struggling” students?
Identify Collaborators

Center for Medical Education

Academic Support Systems
- Learning and Executive Function resources
- Technology support orientation
- New resident orientation

Committees:
- Learning and teaching
- Curriculum Standards
CLOSING

COLLECTIVELY SEEK TO UNDERSTAND THE SCIENCE OF LEARNING AND ENGAGEMENT;

SHIFT FROM THE VIEW THAT SOME LEARNERS HAVE LIMITATIONS TO THE VIEW THAT SOME METHODS AND MATERIALS HAVE LIMITATIONS;

THERE IS NO AVERAGE...ONLY A GREAT DEAL OF LEARNER VARIABILITY.