Disabilities and the Life Sciences

Equity, Inclusion, and Universal Design

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Topics

Disability and Inclusion

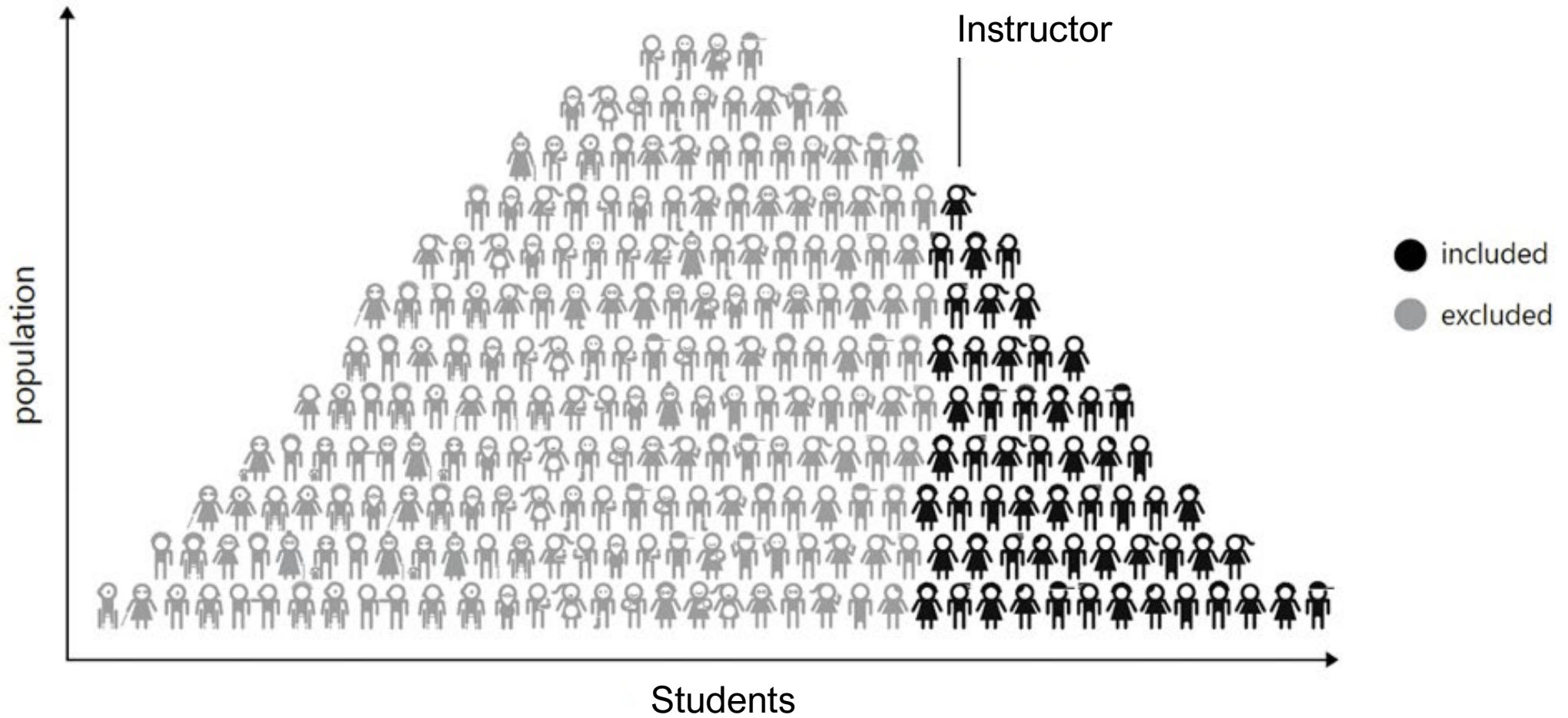What is Disability?

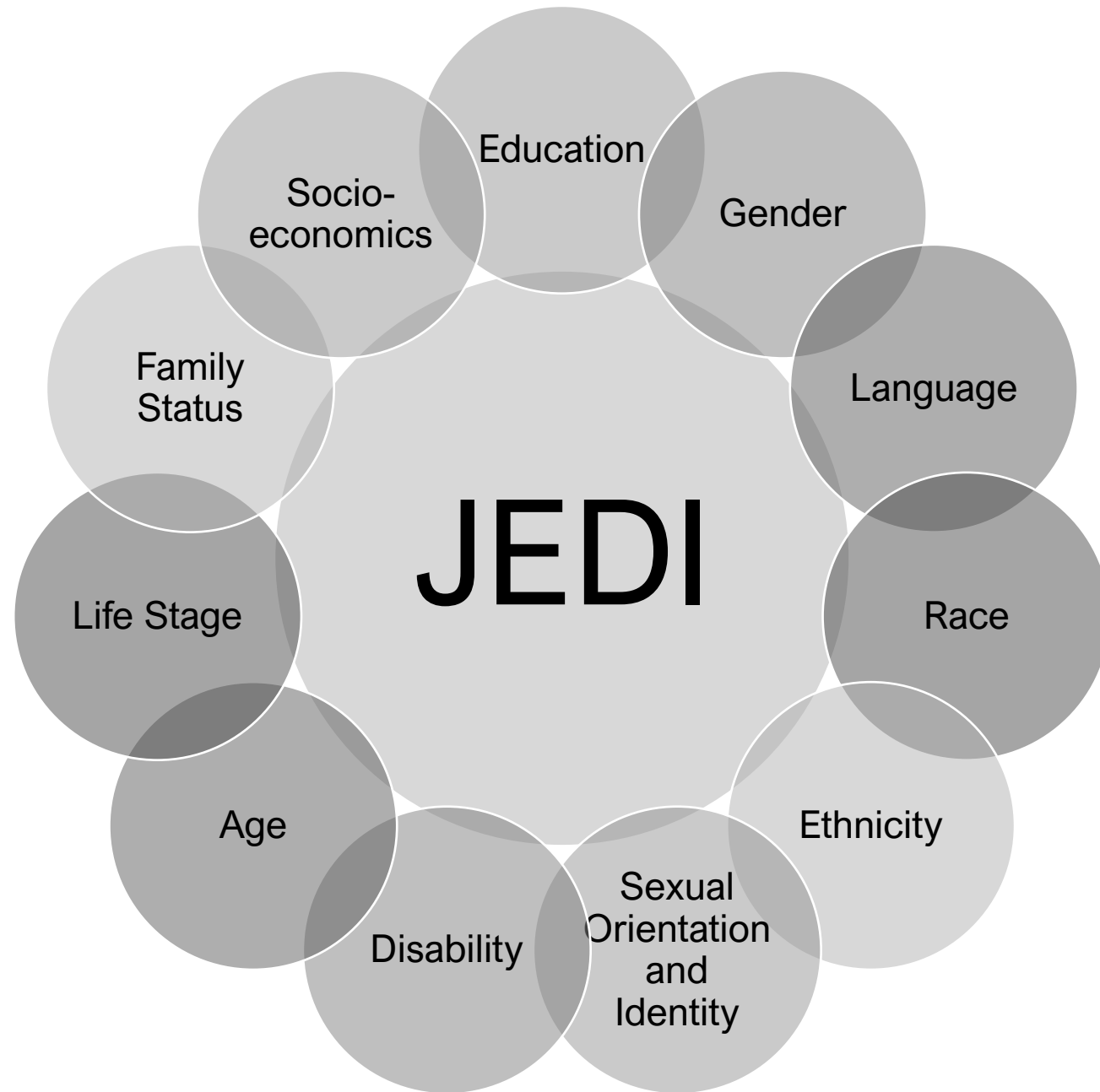Landscape of Disability in STEM

Inclusive Strategies

Reflection #1

What comes to mind when we refer to 'inclusion' in the classroom?

Reflection #2

Who or what might we be leaving out in planning and teaching?

population

Instructor

● included
● excluded

Students

"Visualizing" Disabilities

Visual	Hearing	Cognitive	Speech	Mobility	Neural
• Colorblind	• Hard of hearing	• Learning disabilities	• Speech impediment	• Arthritis	• Bipolar
• Low vision	• Deaf	• Autism	• Unable to speak	• Quadriplegia	• Anxiety
• Blind		• Seizure		• Spinal cord injury	• PTSD
					• OCD
					• Depression

Disabilities come in many forms both visible and unseen

microsoft.com

What is Disability? (Medical Model)

- Legal Definition:

  - "…**a person who has a physical or mental impairment that substantially limits one or more major life activity**. This includes people who have a record of such an impairment, even if they do not currently have a disability. It also includes individuals who do not have a disability but are regarded as having a disability."

What is a Disability? (Social Model)

- Disability as personal attribute

    - "In the context of health experience, a disability is **any restriction or lack of ability (resulting from an impairment) to perform an activity in the manner or within the range considered normal for a human being.**"

- Disability in context

    - "Disability...is a complex phenomenon, reflecting the **interaction between features of a person's body and features of the society in which he or she lives.**"

Disability ≠ Personal Health Condition

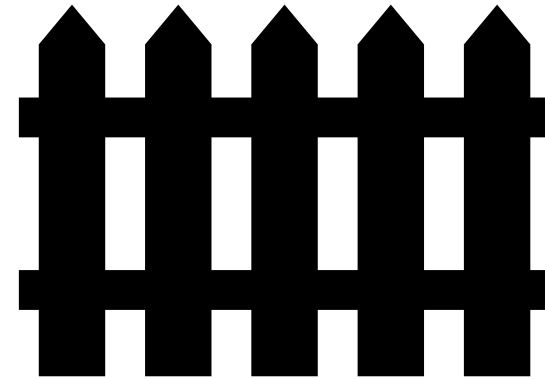Disability = Mismatched Human Interactions

Landscape:
Disability and STEM Education

Student-Focus

Landscape of Disability and STEM Education

- 12% of students in secondary ed
  - only 1% of students enrolled in IB or AP STEM have disclosed
- 10% of students entering postsecondary have self-disclosed
- Skewed recognition of abilities
  - *expectancy effect*
  - very little research in disability sphere
  - logical to assume similar impacts
- Proportion of research on students with disabilities has *decreased* in last twenty years

Schneiderwind, J. and J. Johnson. 2020. "Why Are Students With Disabilities So Invisible in STEM Education?" *Education Week* https://www.edweek.org/education/opinion-why-are-students-with-disabilities-so-invisible-in-stem-education/2020/07

Systemic Barriers in STEM

- Time Accommodations
- Learning environment
- Task execution
- Built environment
- Lack of Accommodation Services
- Instructor implicit and explicit bias

Jeannis, H., Joseph, J., Goldberg, M., Seelman, K., Schmeler, M., & Cooper, R. A. (2018). Full-participation of students with physical disabilities in science and engineering laboratories. *Disability and Rehabilitation. Assistive Technology, 13*(2), 186–193. https://doi.org/10.1080/17483107.2017.1300348

Inclusive Strategies…for Disabilities

Facilitation of Learning in STEM

- Training instructors, lab assistants, TAs
- Additional time to complete tasks as needed
- Consideration of lab groupings in learning environment
- Use of assistive technologies
- Wide array of learning opportunities
- Representation matters
- Input from those with disabilities for built environment, equipment, and technology

What is Universal Design for Learning (UDL)?

"the design of products and environments to be **usable by all people**, to the greatest extent possible, without the need for adaptation or specialized design"

CAST | Until learning has no limits®

One arm

Arm injury

New parent
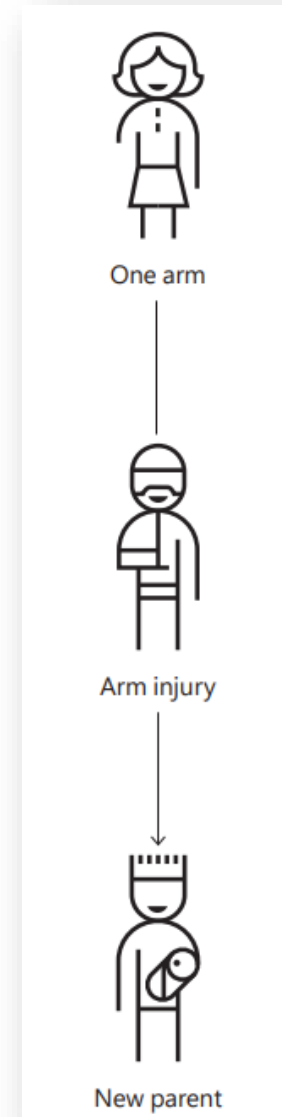
Main Principles of UDL

AFFECTIVE NETWORKS:
THE **WHY** OF LEARNING

Engagement

For purposeful, motivated learners, stimulate interest and motivation for learning.

Explore Engagement ↗

RECOGNITION NETWORKS:
THE **WHAT** OF LEARNING

Representation

For resourceful, knowledgeable learners, present information and content in different ways.

Explore Representation ↗

STRATEGIC NETWORKS:
THE **HOW** OF LEARNING

Action & Expression

For strategic, goal-directed learners, differentiate the ways that students can express what they know.

Explore Action & Expression ↗

Thank you!

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