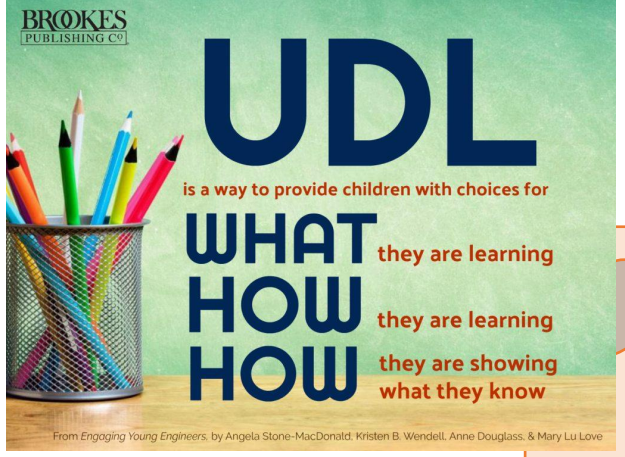
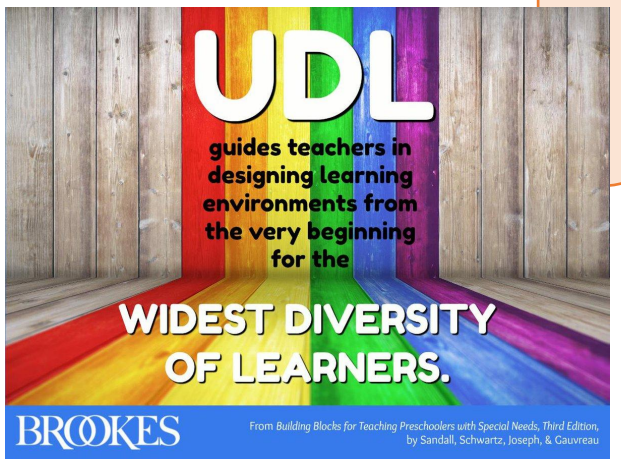


Universal Design of Learning (UDL):

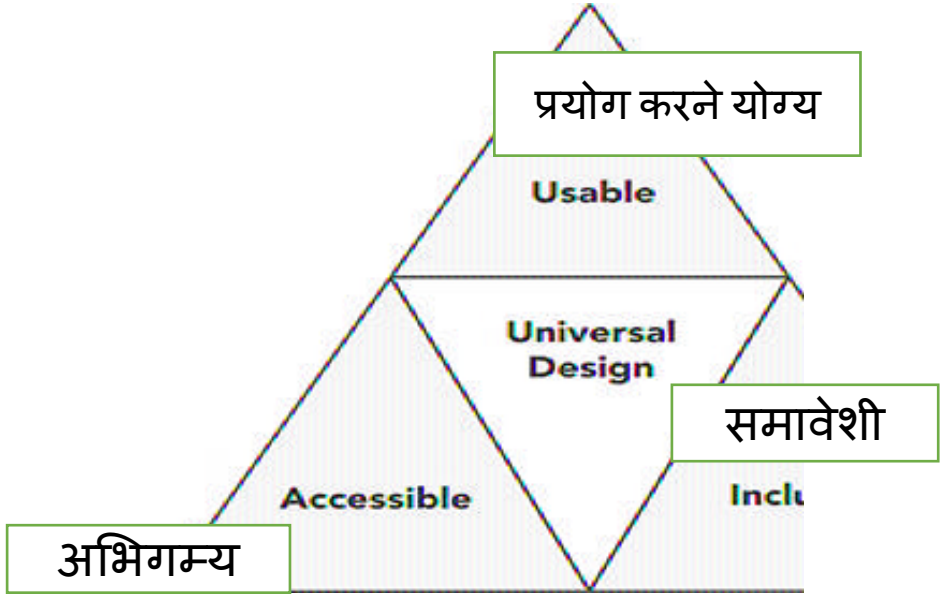
Accessible Digital Resources and Assistive Technologies



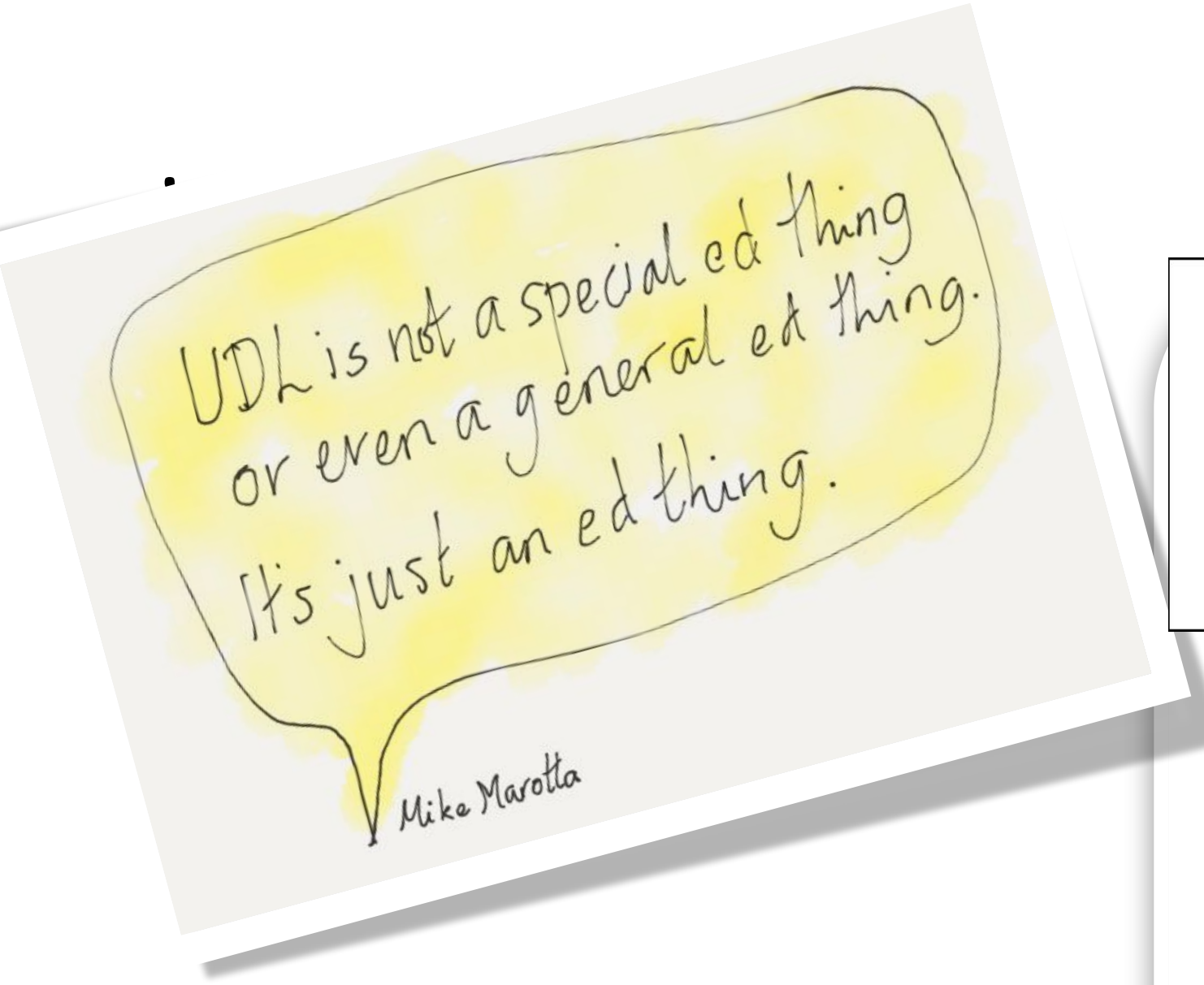
Prof. Renu Malaviya
Dept. of Education
Lady Irwin College
University of Delhi

Universal Design of Learning (UDL)

सीखने का सार्वभौमिक डिज़ाइन

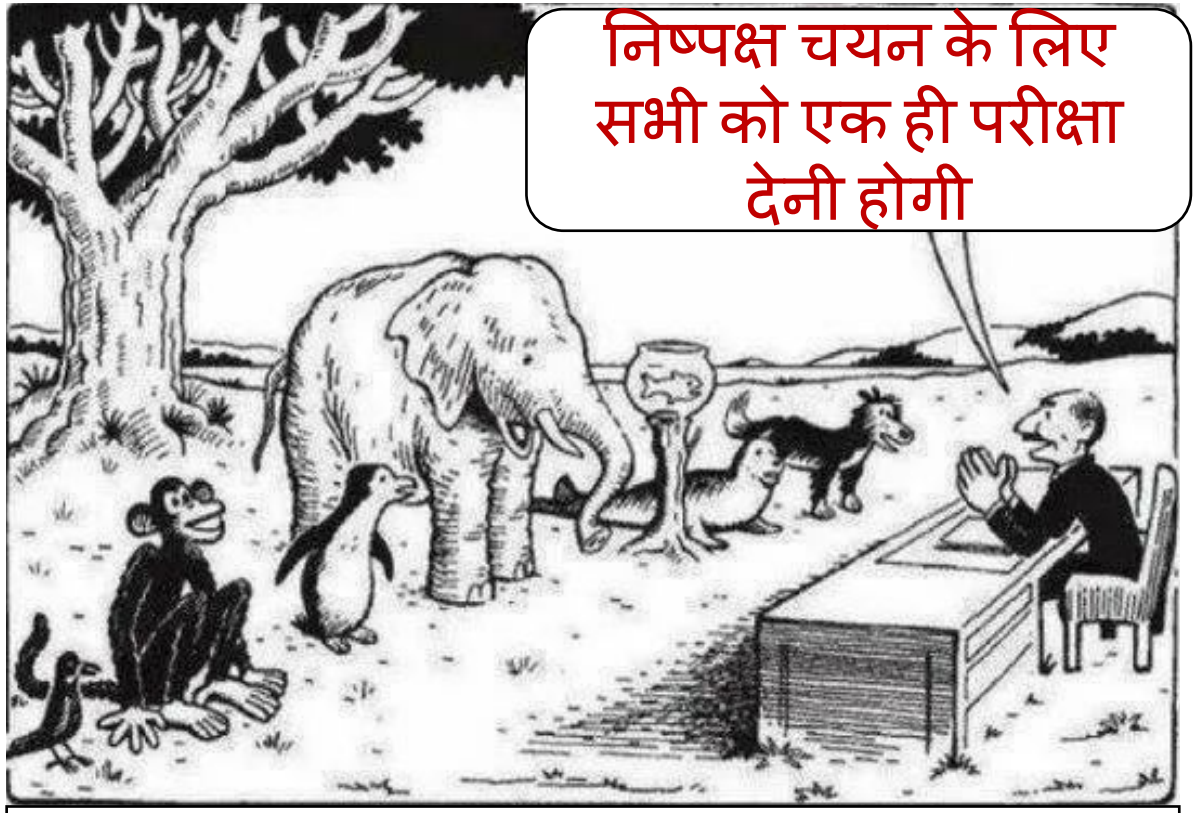


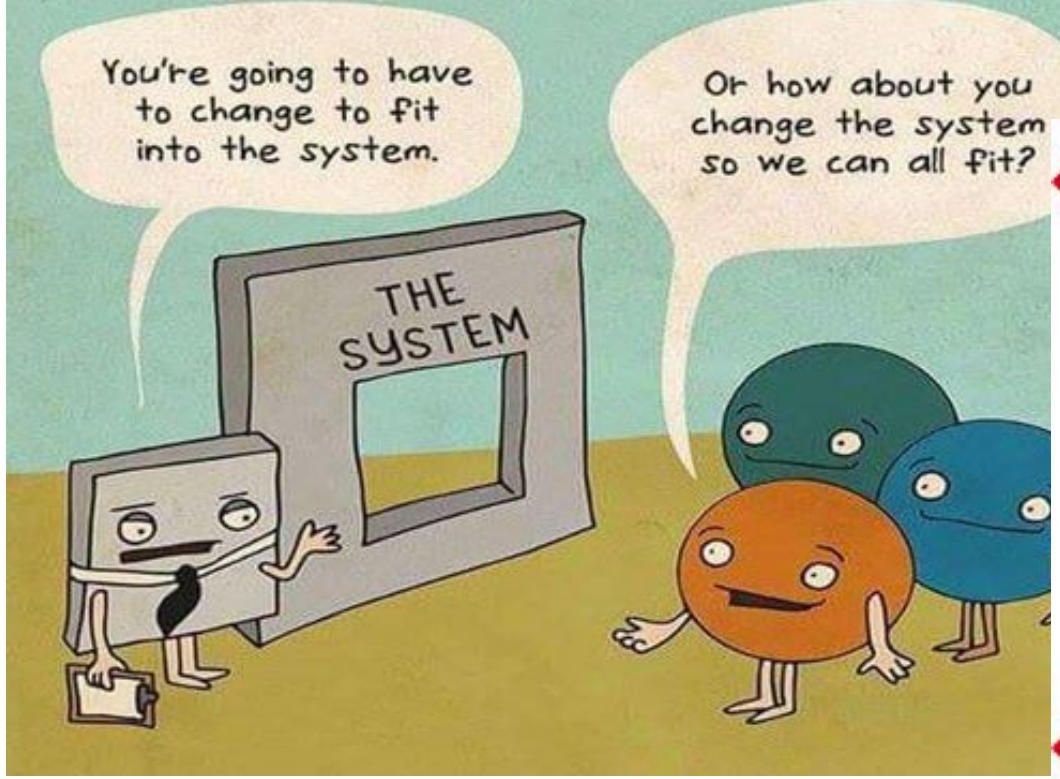
An approach to ensure that educational programs serve all students. UDE goes beyond accessible design for people with disabilities to make all aspects (पहलू) of the educational experience (शैक्षिक अनुभव) more inclusive (समावेशी) for students, staff, instructors, administrators, and visitors with a great variety of characteristics, including those related to gender, race and ethnicity, age, stature, disability, and learning preference.

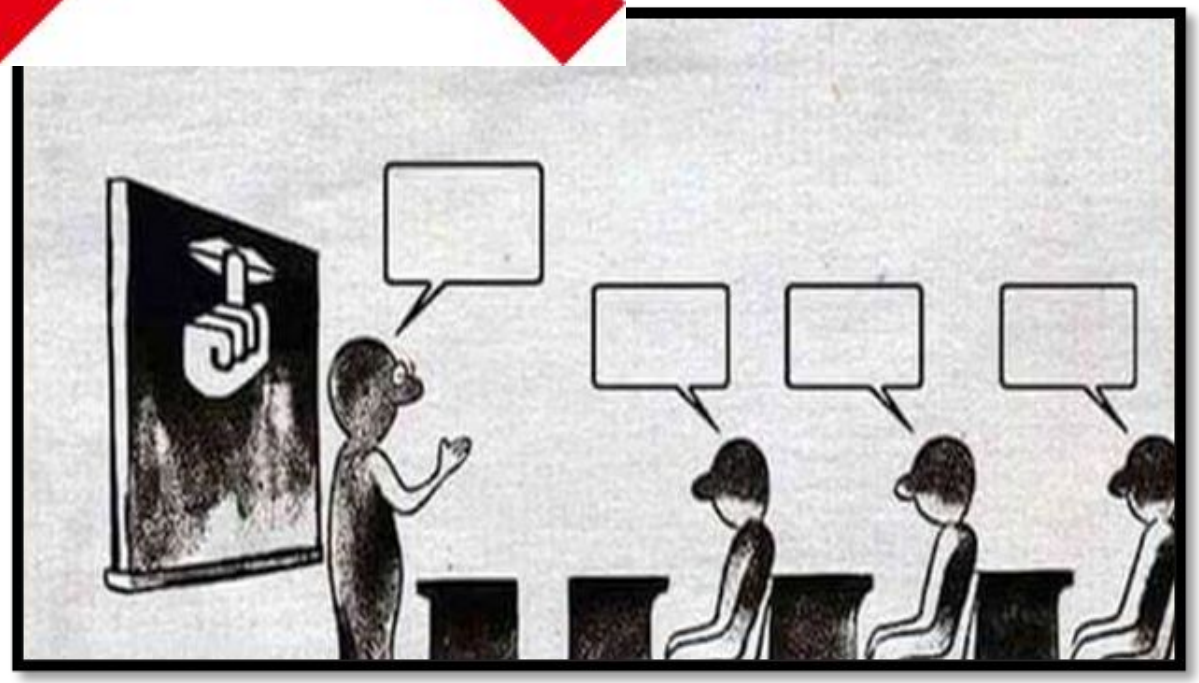


अगर कोई बच्चा हमारे पढ़ाने के तरीके से नहीं सीख पाता, तो शायद हमें उसी तरह सिखाना चाहिए जिस तरह वे बच्चा सीख सकता है

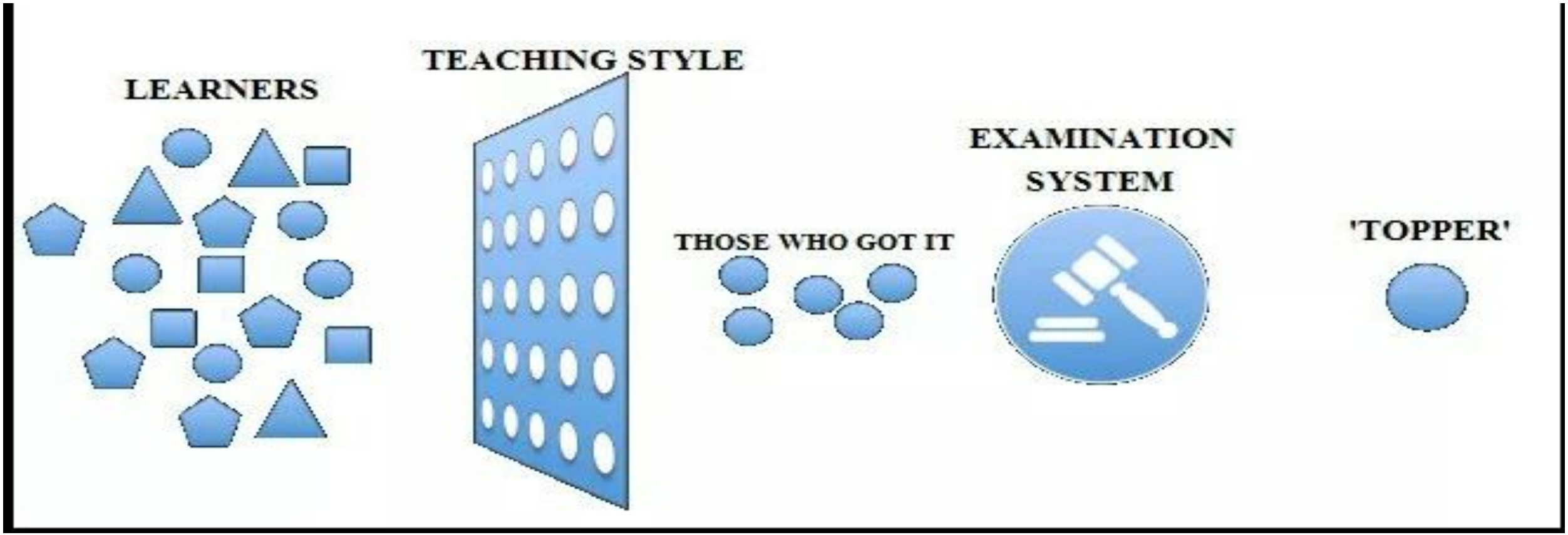
Why UDL????
As Everyone is different

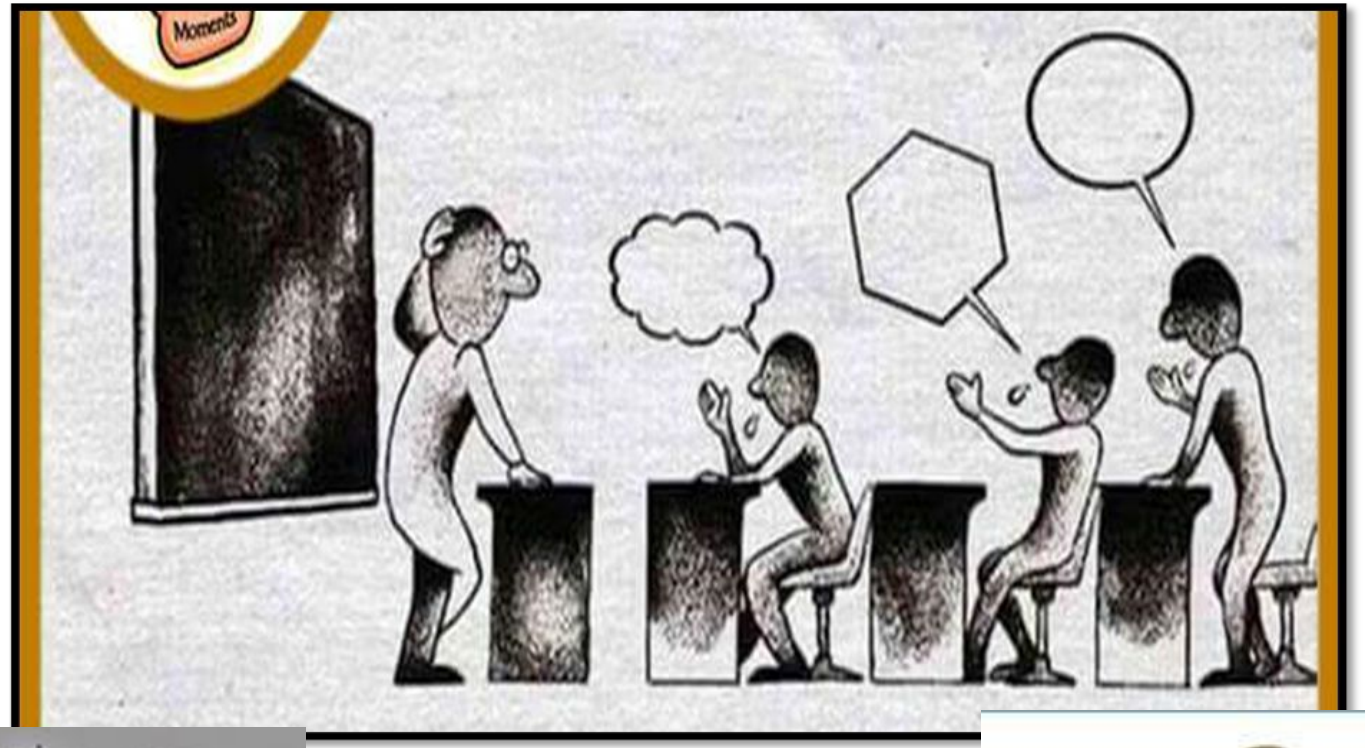



You're going to have to change to fit into the system.
Or how about you change the system so we can all fit?
THE SYSTEM

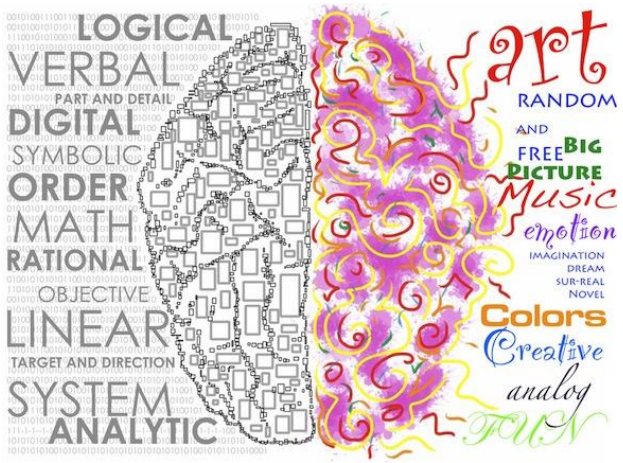


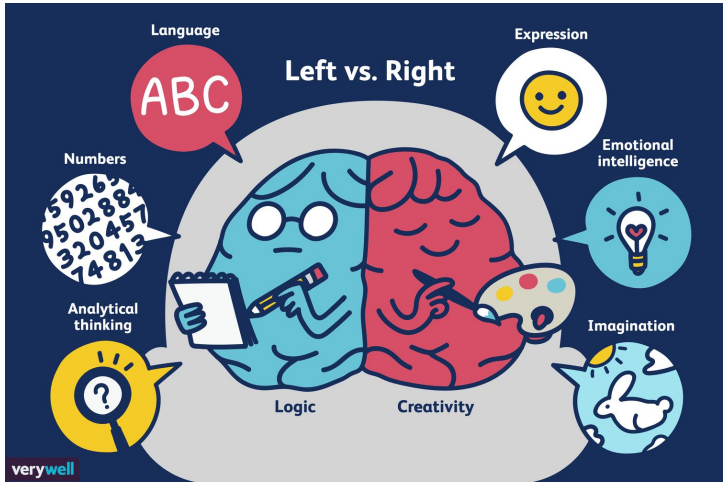
SO MANY DROP-OUTS!!!!

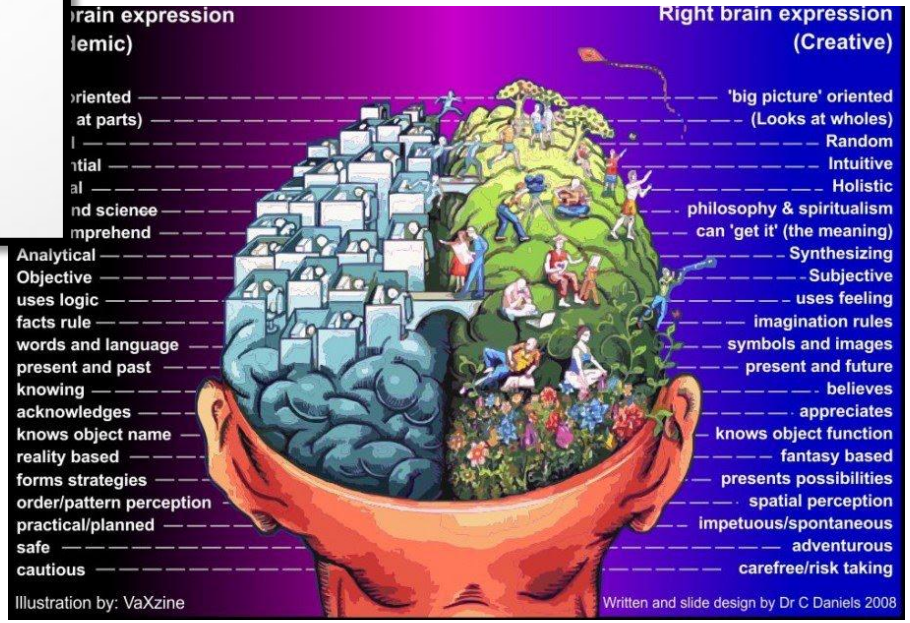



Moments

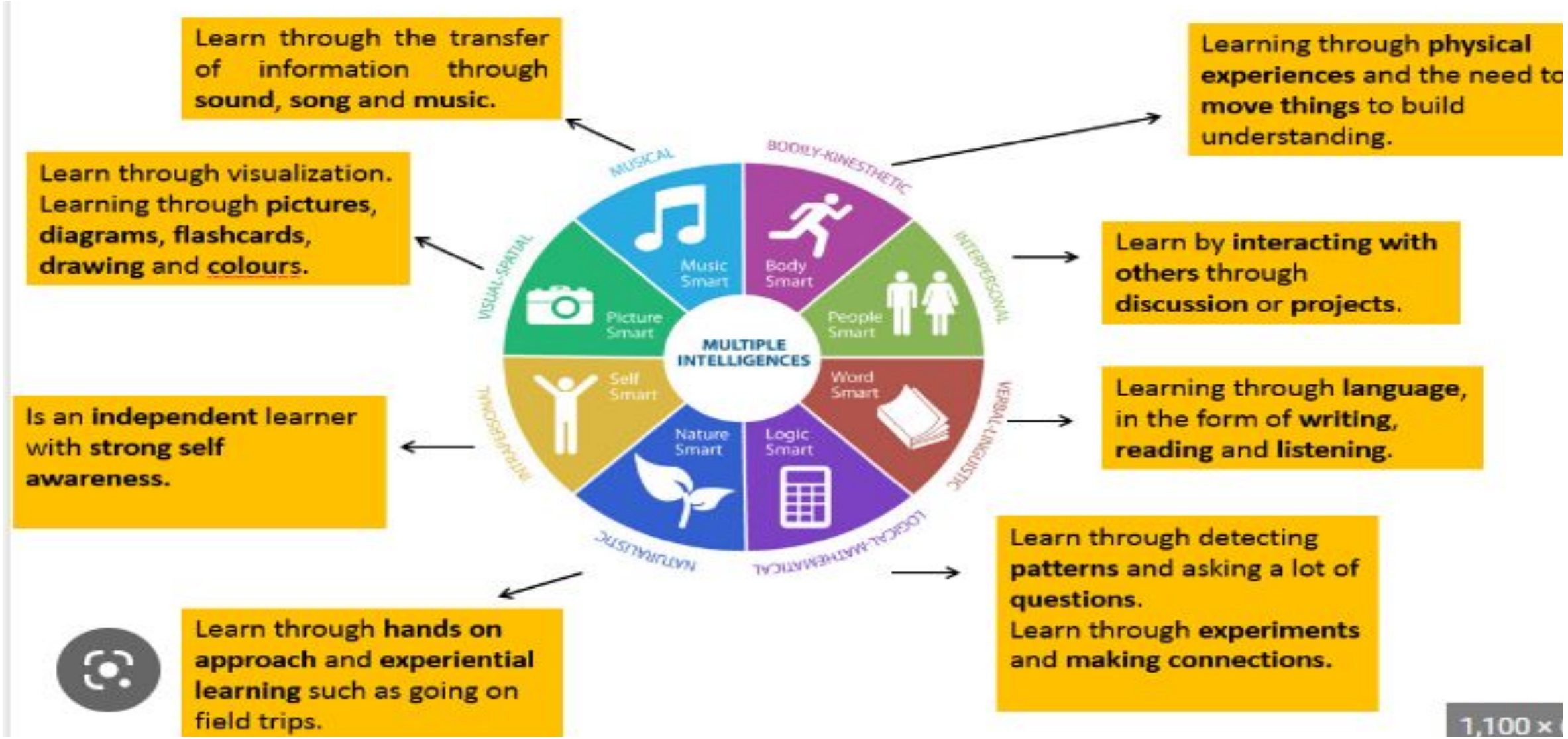
Different Types of brains



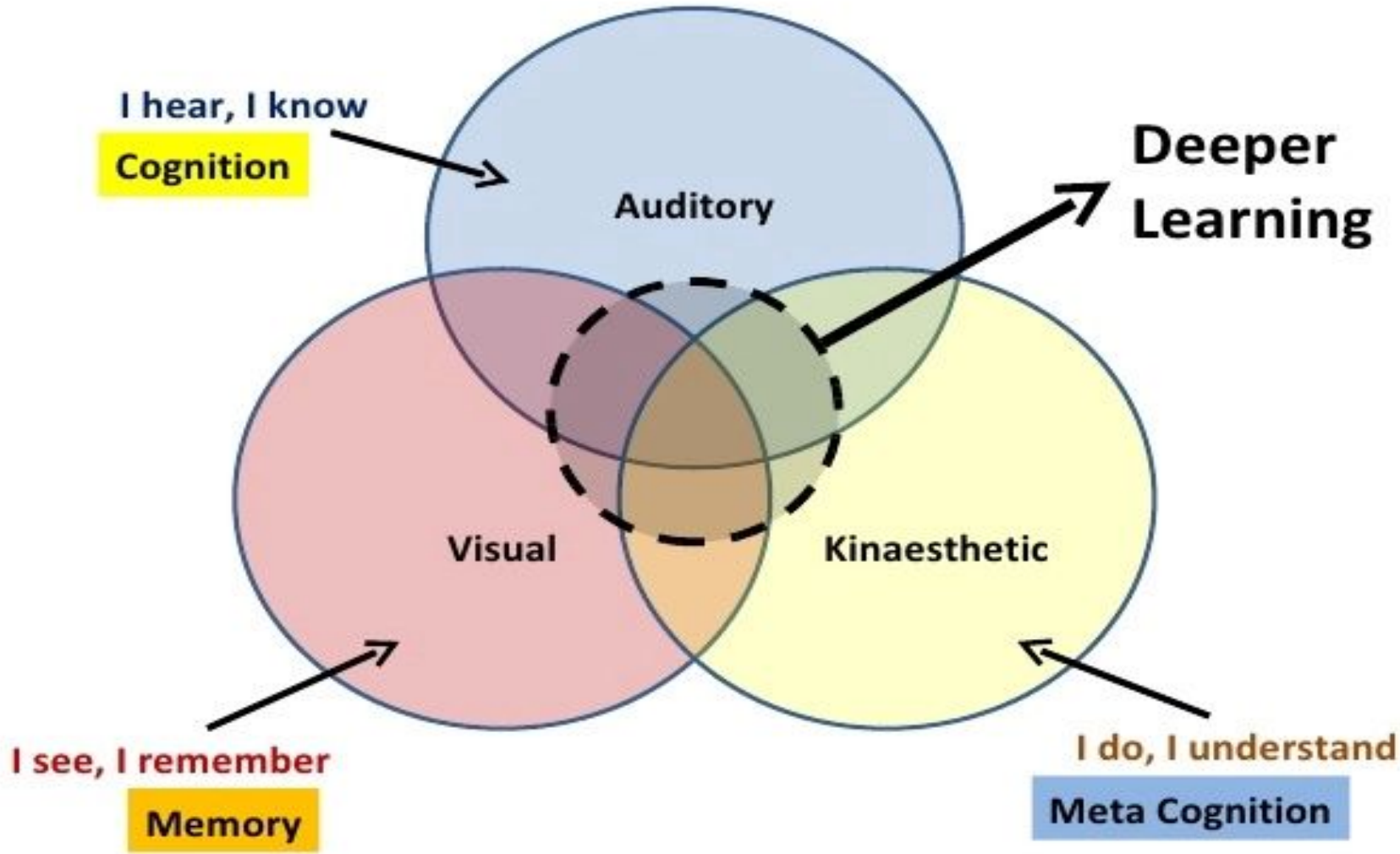




Multiple Intelligence



Multi-Modal Learning



cc Steve Wheeler, University of Plymouth, 2009

WHAT IS THE 'LEARNING STYLE' ?

The term 'learning styles' speaks to the understanding that every student learns differently. Technically, an individual's learning refers to the preferential way in which the student absorbs, comprehends and retains the information.For example, when learning how to build a clock, some students understand the process by following verbal instructions, while others have to physically manipulate the clock themselves.

Learning Styles

VERBAL

Words are your strongpoint! You prefer to use words both in speech and in writing!

VISUAL

You prefer to use pictures, diagrams, images and spatial understanding to help you learn

MUSICAL / AUDITORY

You prefer using sounds or music or even rhythms to help you learn.

PHYSICAL / KINAESTHETIC

You use your hands, body and sense of touch to help you learn. You might 'act things out'.

WHAT'S YOUR LEARNING STYLE?

LOGICAL / MATHEMATICAL

Learning is easier for you if you use logic, reasoning, systems and sequences.

SOCIAL

You like to learn new things as a part of a group. Explaining your understanding to a group helps you to learn.

SOLITARY

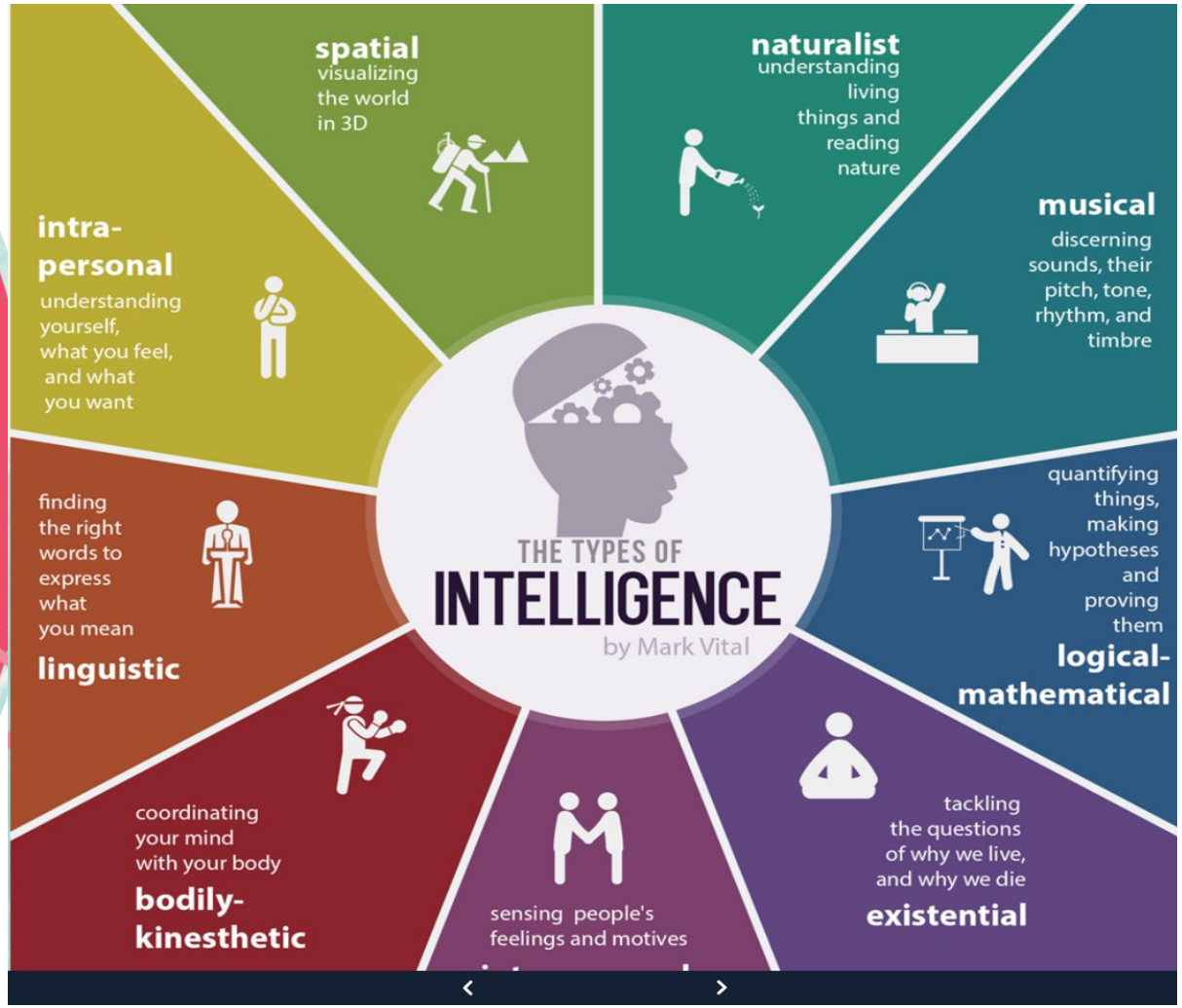
You like to work alone. You use self-study and prefer your own company when learning.

COMBINATION

Your learning style is a combination of two or more of these styles.

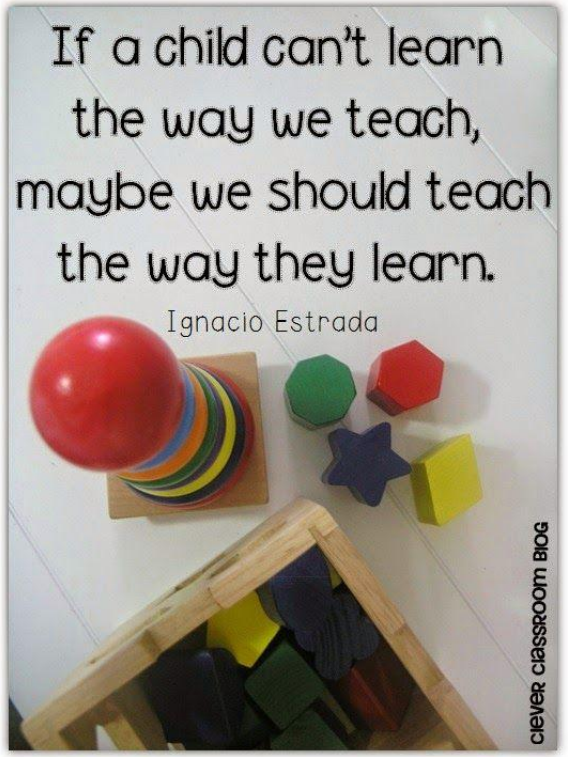
WHAT IS THE 'MULTIPLE INTELLIGENCE'?

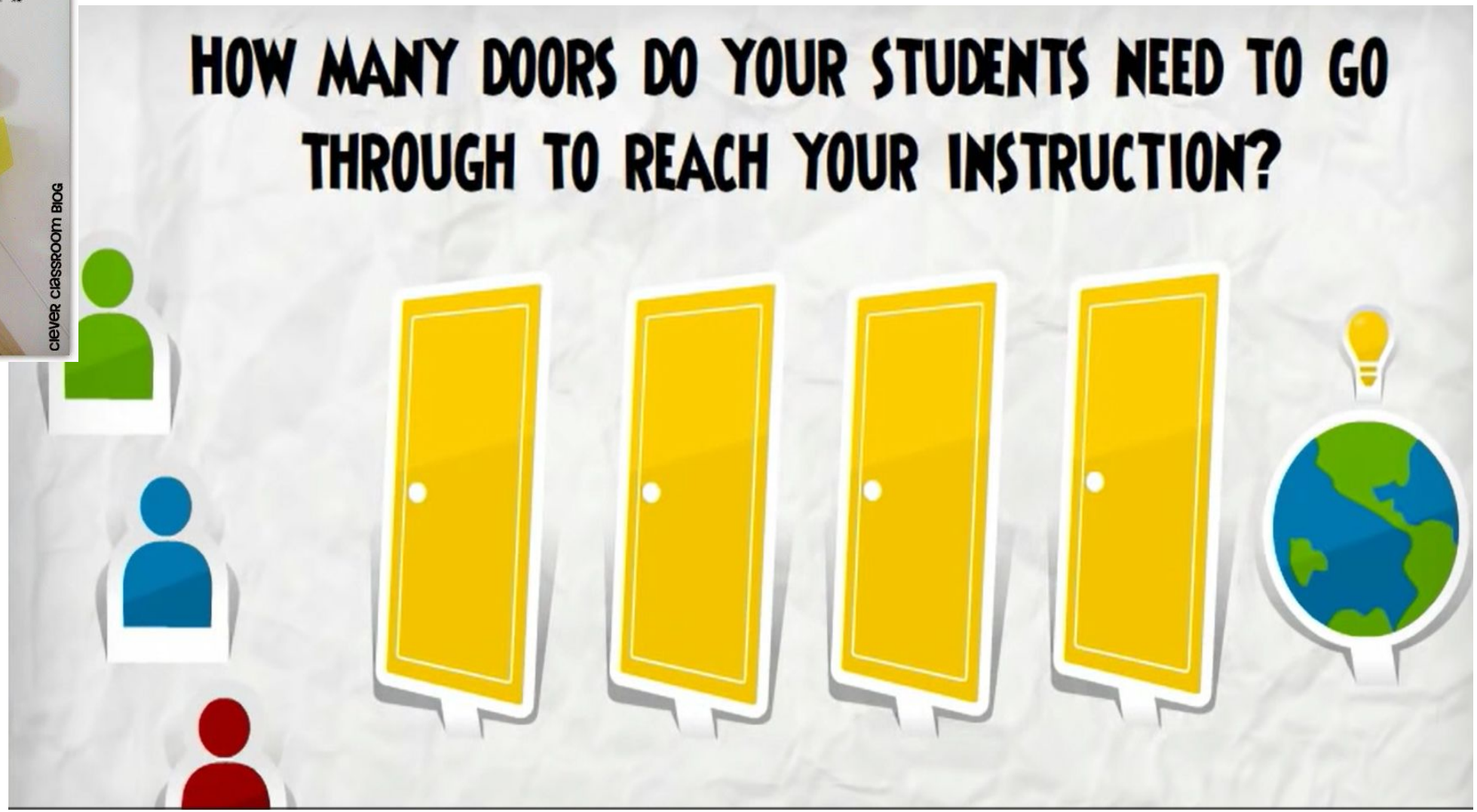
The theory of multiple intelligences is a theory of intelligence that differentiate it into specific modalities, rather than seeing intelligence dominated by a single general ability. In each of us there are different areas of intelligence which are developed to different degrees. This theory was proposed by Howard Gardner in his 1983 book *Frames of Mind*.



CONCLUSION

Analyzing learners' needs and preferences, and adapting the teaching to suit students' learning styles is worth to effort because learners become increasingly engaged in their learnings. Learners are very different from one another; they learn best in different ways and they have different levels of motivation. Learners will respond best when their individual differences are respected and where possible, catered for.


If a child can't learn
the way we teach,
maybe we should teach
the way they learn.
Ignacio Estrada
clever classroom blog


HOW MANY DOORS DO YOUR STUDENTS NEED TO GO THROUGH TO REACH YOUR INSTRUCTION?

HOW MANY DOORS DO YOUR STUDENTS NEED TO GO THROUGH TO REACH YOUR INSTRUCTION?

LEARNING

विद्वता

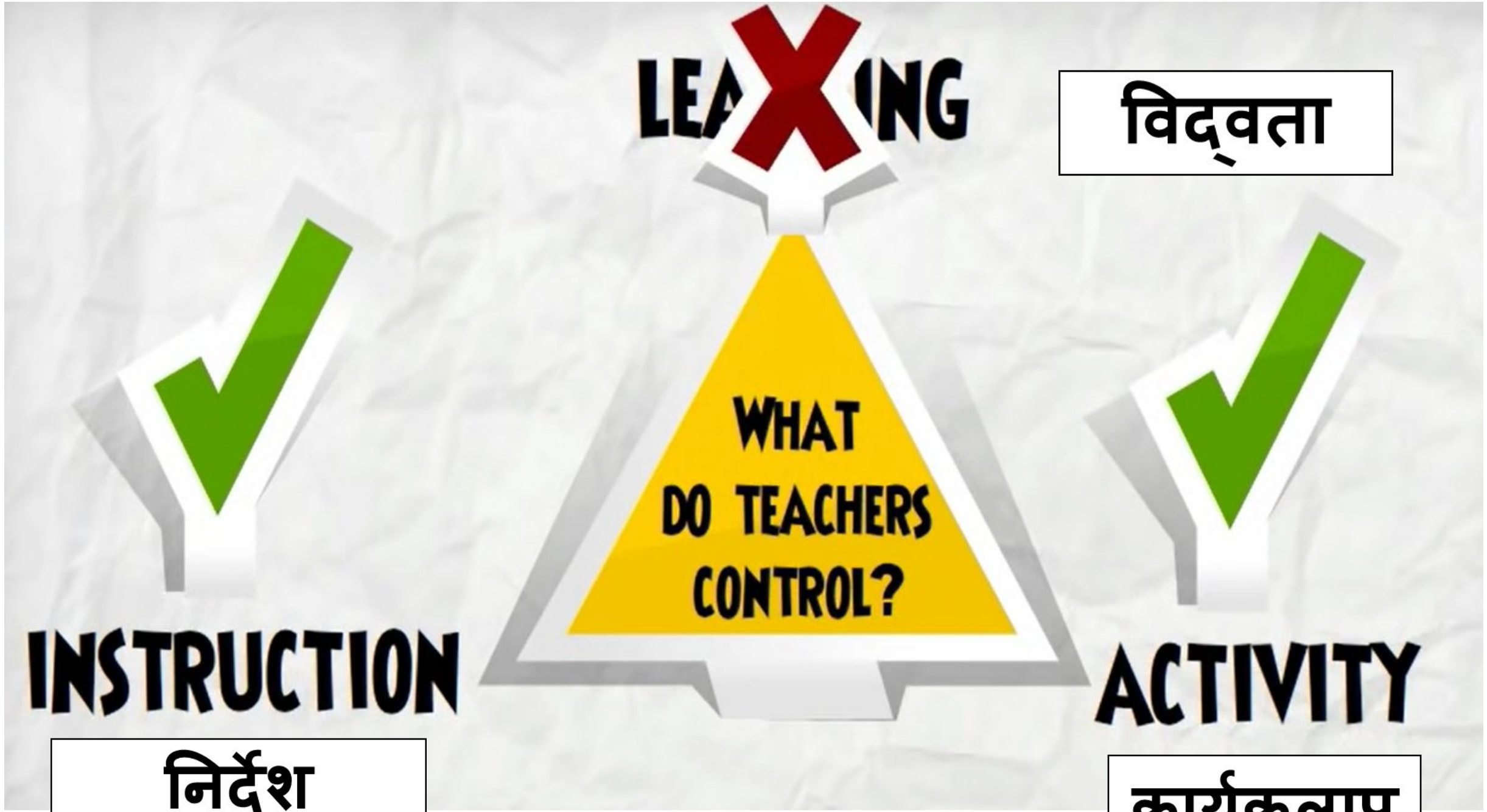
WHAT DO TEACHERS CONTROL?

निर्देश

INSTRUCTION

कार्यकलाप

ACTIVITY



विद्वता

निर्देश

कार्यकलाप

UNIVERSAL DESIGN FOR LEARNING IMPROVES EDUCATIONAL OUTCOMES FOR ALL STUDENTS

LEVEL 4

Personal Assistant

LEVEL 3

Individual accommodation

LEVEL 2

Students with similar needs

LEVEL 1

Universal Design for the majority of students

SPECIAL

GENERAL

AFFECTIVE NETWORKS:

THE **WHY** OF LEARNING

Engagement

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

RECOGNITION NETWORKS:

THE **WHAT** OF LEARNING

Representation

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

STRATEGIC NETWORKS:

THE **HOW** OF LEARNING

Action & Expression

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

Learning happens when students are able to…

Recognize, perceive, and understand information

recognition networks

Strategize how to learn and successfully demonstrate mastery

strategic networks

Stay motivated, engaged, and participating

affective networks

…so effective teaching of diverse learners includes:

1.

Multiple Means of Representation

2.

Multiple Means of Action & Expression

3.

Multiple Means of Engagement

The Universal Design for Learning Guidelines

CAST | Until learning has no limits

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

Access

Provide options for Recruiting Interest

- Optimize individual choice and autonomy
- Optimize relevance, value, and authenticity
- Minimize threats and distractions

Provide options for Perception

- Offer ways of customizing the display of information
- Offer alternatives for auditory information
- Offer alternatives for visual information

Provide options for Physical Action

- Vary the methods for response and navigation
- Optimize access to tools and assistive technologies

Build

Provide options for Sustaining Effort & Persistence

- Heighten salience of goals and objectives
- Vary demands and resources to optimize challenge
- Foster collaboration and community
- Increase mastery-oriented feedback

Provide options for Language & Symbols

- Clarify vocabulary and symbols
- Clarify syntax and structure
- Support decoding of text, mathematical notation, and symbols
- Promote understanding across languages
- Illustrate through multiple media

Provide options for Expression & Communication

- Use multiple media for communication
- Use multiple tools for construction and composition
- Build fluencies with graduated levels of support for practice and performance

Internalize

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 Comprehension

- Activate or supply background knowledge
- Highlight patterns, critical features, big ideas, and relationships
- Guide information processing and visualization
- Maximize transfer and generalization

Provide options for Executive Functions

- Guide appropriate goal-setting
- Support planning and strategy development
- Facilitate managing information and resources
- Enhance capacity for monitoring progress

Goal

Expert learners who are...

Purposeful & Motivated

Resourceful & Knowledgeable

Strategic & Goal-Directed

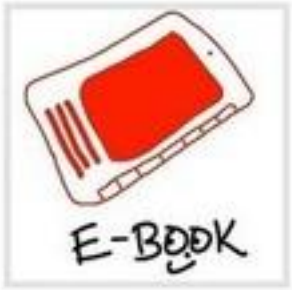
udlguidelines.cast.org | © CAST, Inc. 2018 | Suggested Citation: CAST (2018). Universal design for learning guidelines version 2.2 [graphic organizer]. Wakefield, MA: Author.

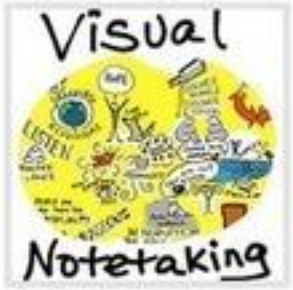
Different ways of Engagement: The Why of Learning

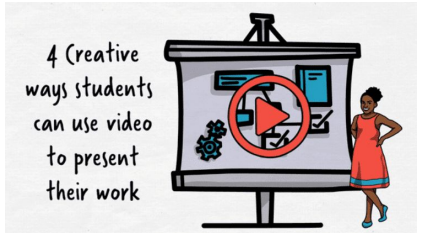
Different types of Representation: What of Learning

Scales printed on children desk with its width, height and weight will provide them an accessible yardstick to develop and comprehend the concept of measurement.

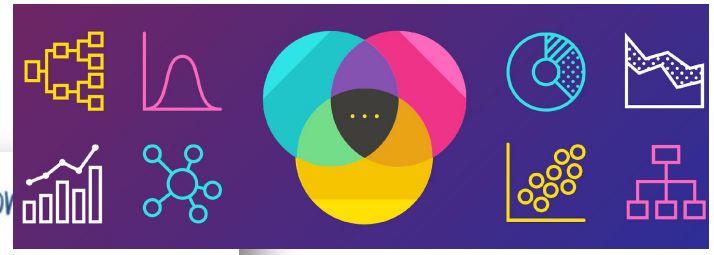
Different types of Action & Expression







Action and Expressions



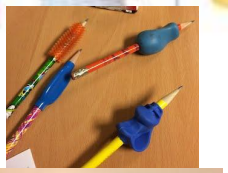
Universal Design for Learning: Expression & Communication

Select the strategy you want to use to express your ideas and share what you know.

Compose a Piece of Writing	Record an Audio Explanation	Create an Illustration	Combine Drawings and Text (e.g., Comic or Graphic Story)
Sketch Out a Storyboard	Design a Flowchart	Sketchnotes	Produce a Video or Digital Story
Create Visual Art (e.g., Sculpture or Model)	Express Yourself Through Movement or Music (e.g., Reenactment or Dance)	Surface Connections with a Concept Map	**Your Choice** Design Your Own

Examples of Assistive Technology

No Tech	Low Tech	High Tech
Pencil grip	Buzzers	E-Readers
Post-it-notes	Portable word processors	Touch screen devices
Slanted surfaces	Talking Calculator	Computerized testing
Raised lined paper	MP3 player	Speech Recognition Software
Covered overlays	Electronic organizers	Word Processors
Tactile letters	Switches/Buzzers	Text-to-Speech(TTS)
Magnifying bars	Lights	Progress Monitoring Software
Weighted pencils		



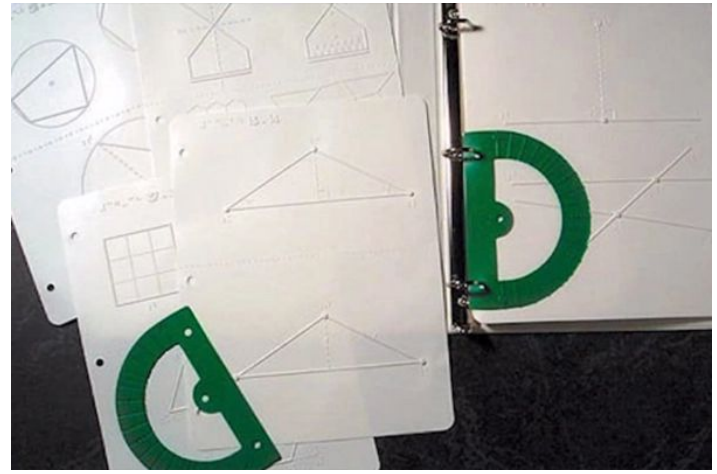
Assistive Devices and UDL

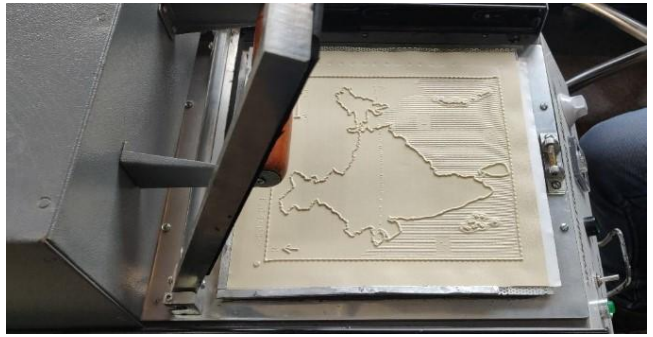
- Screen magnifiers

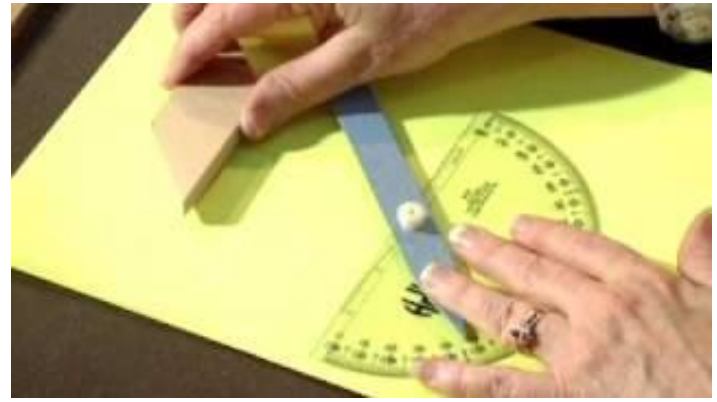
Assistive Devices for Hearing Challenged

- Teletypewriter (TTY)
- Telecommunications device for the deaf (TDD)
- Voice to text software programs
- CART Communication Real-Time Translation
- Personal FM systems
- Soundfield systems
- Captioning Services for video/audio productions
- Face to Face Communication Systems

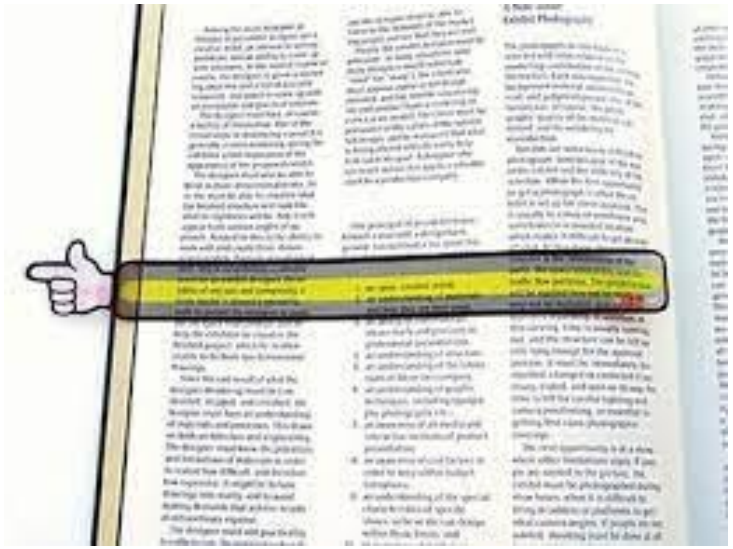
Assistive Devices for Visually Challenged

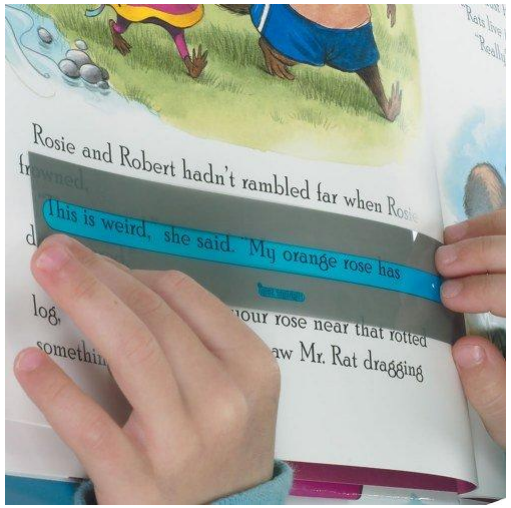


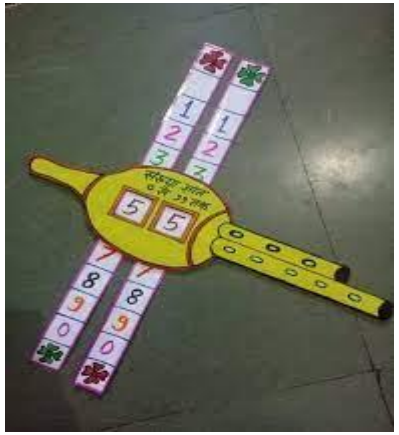


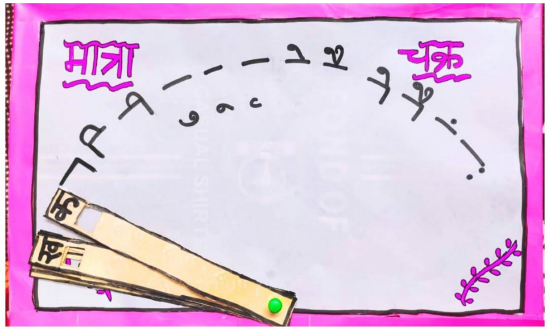


Assistive Devices for SLD

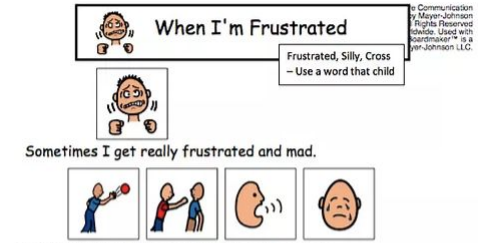


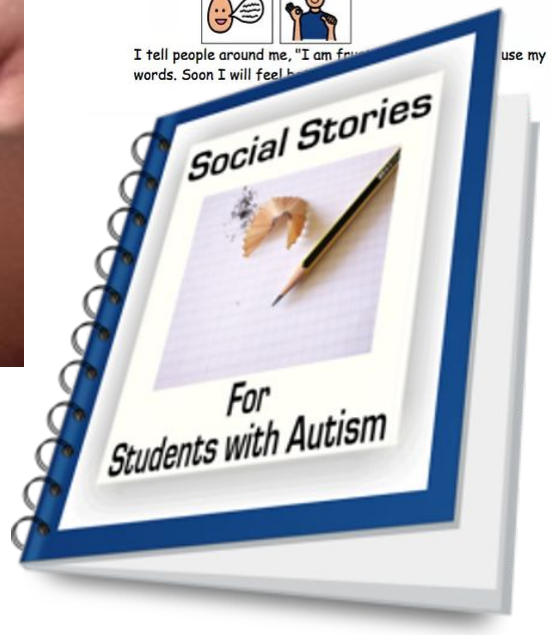






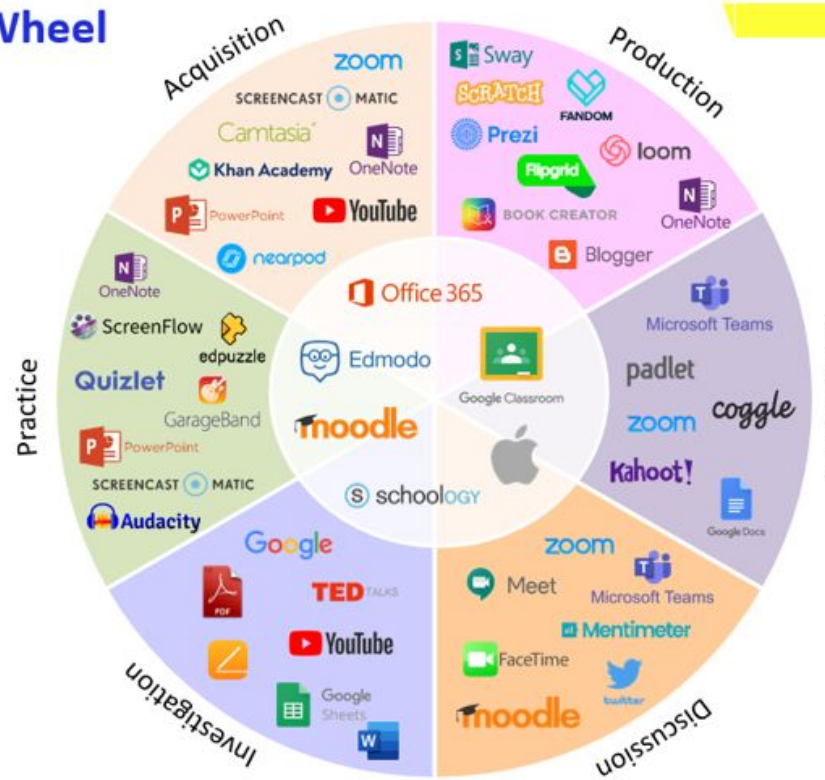
Assistive Devices for Autism Spectrum Disorder





Multi-Media Learning Platform
Digital Tools for Finding Information
Digital Tools for Understanding Information
Digital Tools for Using Information
Digital Tools to Support Writing
Flexible Learning Paths

ogy Wheel


Acquisition
Production
Collaboration
Discussion
Investigation
Practice
zoom
SCREENCAST MATIC
Camtasia
Khan Academy
OneNote
PowerPoint
YouTube
nearpod
Sway
SCRATCH
FANDOM
Prezi
loom
Flipgrid
BOOK CREATOR
OneNote
Blogger
Office 365
Edmodo
Google Classroom
moodle
schoology
Microsoft Teams
padlet
zoom
coggle
Kahoot!
Google Docs
OneNote
ScreenFlow
edpuzzle
Quizlet
GarageBand
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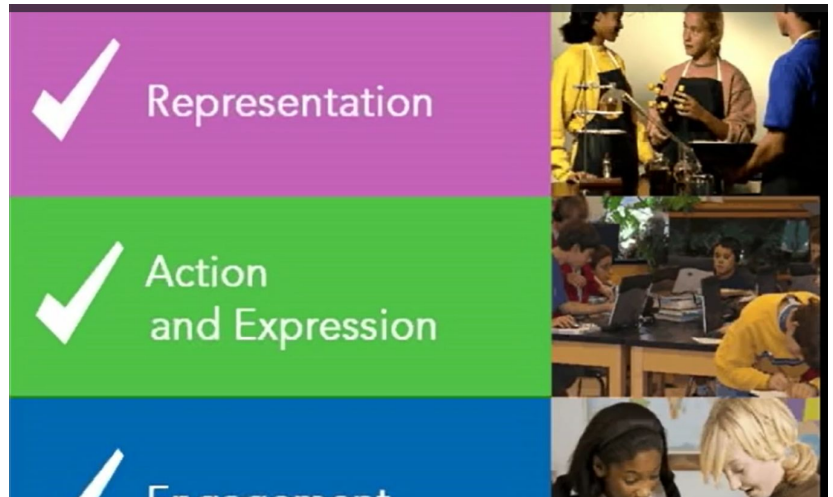
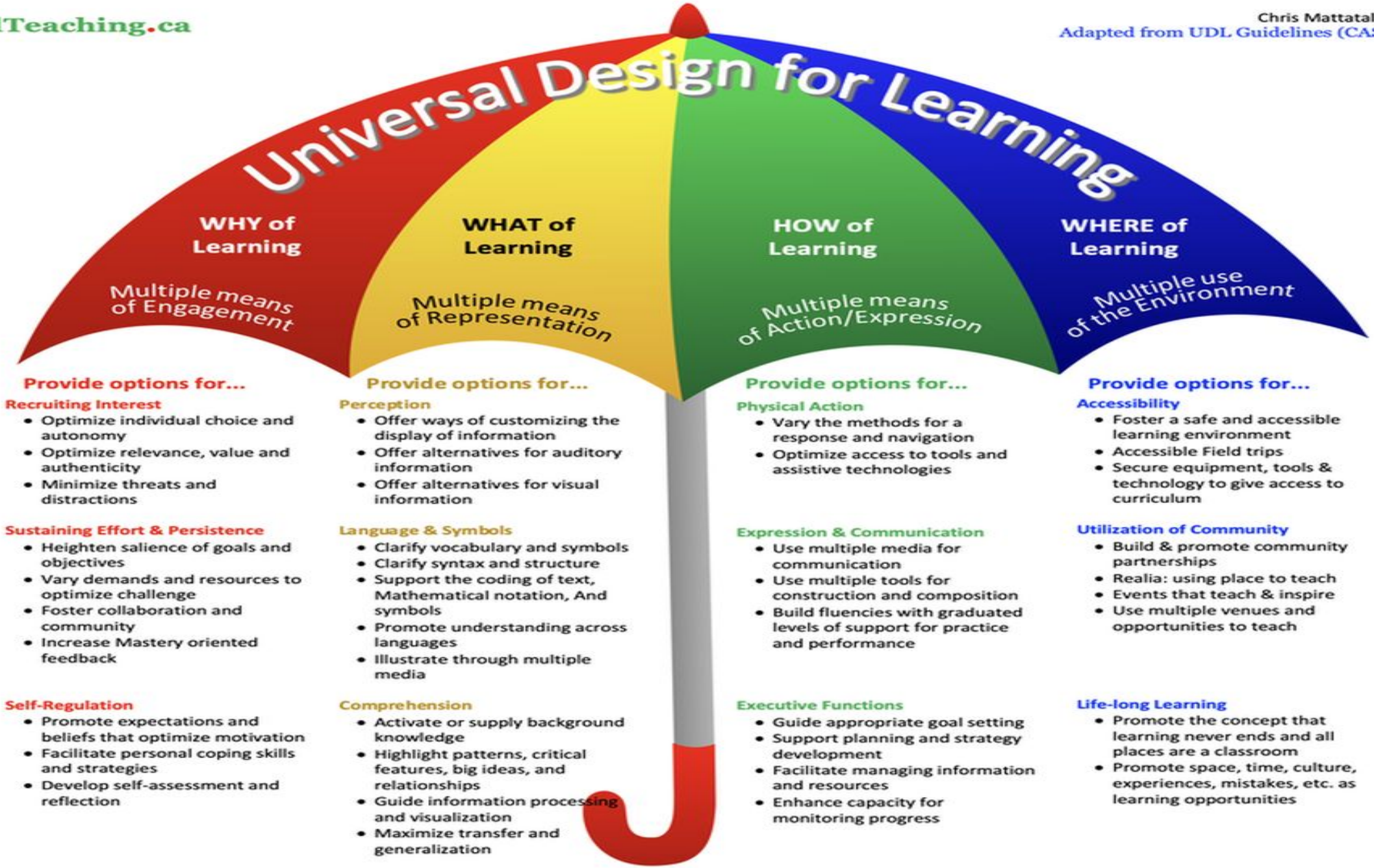
FaceTime
moodle


Representation
Action and Expression

GoodTeaching.ca

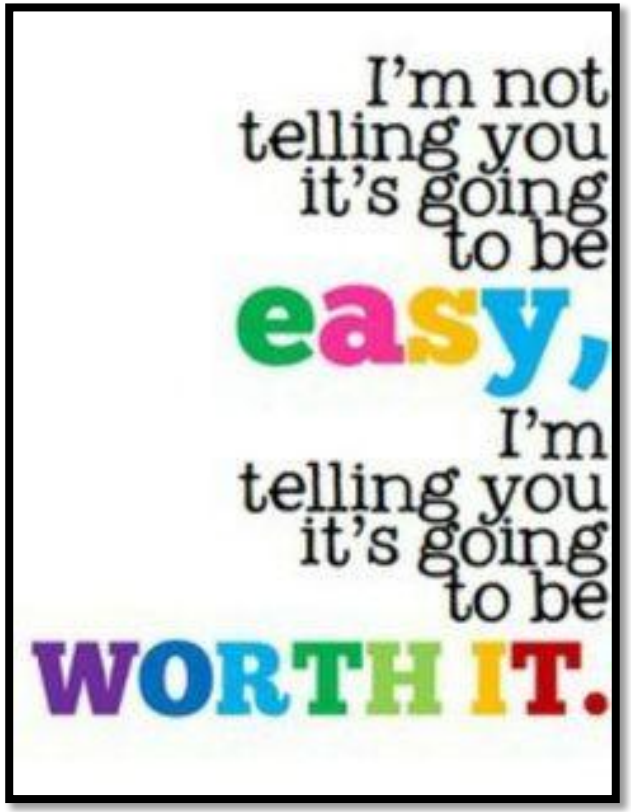
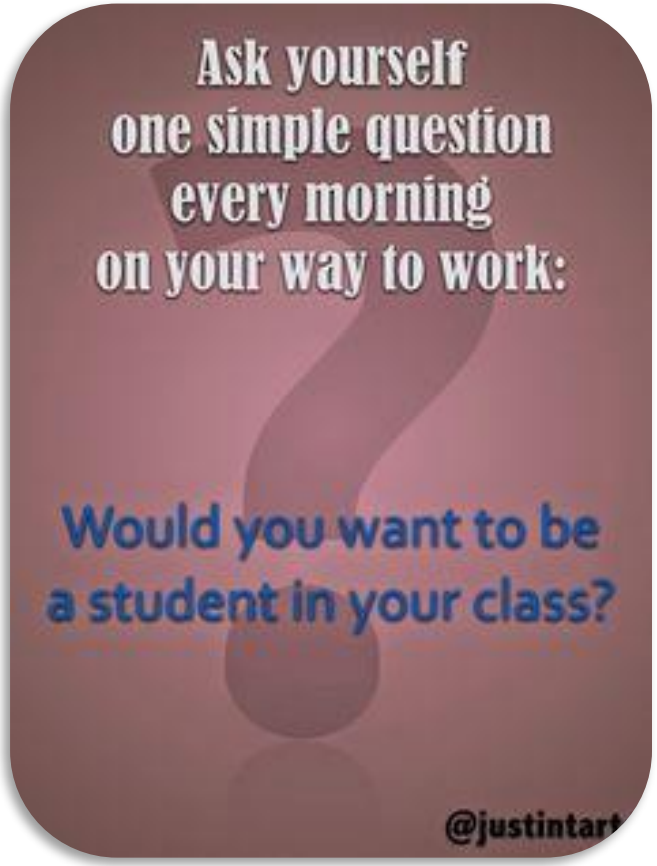
Chris Mattatall (2022)
Adapted from UDL Guidelines (CAST.org)

Universal Design for Learning



	Provide options for...	Provide options for...	Provide options for...	Provide options for...	
ACCESS	**Recruiting Interest** • Optimize individual choice and autonomy • Optimize relevance, value and authenticity • Minimize threats and distractions	**Perception** • Offer ways of customizing the display of information • Offer alternatives for auditory information • Offer alternatives for visual information	**Physical Action** • Vary the methods for a response and navigation • Optimize access to tools and assistive technologies	**Accessibility** • Foster a safe and accessible learning environment • Accessible Field trips • Secure equipment, tools & technology to give access to curriculum	ACCESS
BUILD	**Sustaining Effort & Persistence** • Heighten salience of goals and objectives • Vary demands and resources to optimize challenge • Foster collaboration and community • Increase Mastery oriented feedback	**Language & Symbols** • Clarify vocabulary and symbols • Clarify syntax and structure • Support the coding of text, Mathematical notation, And symbols • Promote understanding across languages • Illustrate through multiple media	**Expression & Communication** • Use multiple media for communication • Use multiple tools for construction and composition • Build fluencies with graduated levels of support for practice and performance	**Utilization of Community** • Build & promote community partnerships • Realia: using place to teach • Events that teach & inspire • Use multiple venues and opportunities to teach	BUILD
INTERNALIZE	**Self-Regulation** • Promote expectations and beliefs that optimize motivation • Facilitate personal coping skills and strategies • Develop self-assessment and reflection	**Comprehension** • Activate or supply background knowledge • Highlight patterns, critical features, big ideas, and relationships • Guide information processing and visualization • Maximize transfer and generalization	**Executive Functions** • Guide appropriate goal setting • Support planning and strategy development • Facilitate managing information and resources • Enhance capacity for monitoring progress	**Life-long Learning** • Promote the concept that learning never ends and all places are a classroom • Promote space, time, culture, experiences, mistakes, etc. as learning opportunities	INTERNALIZE

DIFFERENTIATION IS A PLANNING AND TEACHING METHOD APPLIED TO EACH COLUMN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