

There is no “typical” student. How can we design courses that engage diverse students and provide mechanisms for students to accurately demonstrate their learning. Universal Design for Learning (UDL) helps us build courses accessible to all students. UDL encourages course designs to empower students in how they acquire information and demonstrate learning. Open Educational Practices (OEP) can be a key strategy to help establish UDL in your courses. We will look at course designs that increase student choice, encourage critical thinking, and improve learning. When paired with Backwards Design, UDL and OEP strategies also help us build assignments that more accurately measure student learning outcomes (SLO). This workshop will demonstrate how these frameworks can be used to design effective and engaging online learning activities and assessments

Can pull from: <https://docs.google.com/presentation/d/1CoTtbMCK-XnsW6LLCJFPOe8C3Va83FcR/edit#slide=id.p17>

We trade off:

1. Intro - & intro to UDL - Amanda (this section is the why)
 - a. Q&A / Discussion
 - b. 20 min (1:40)

THE HOW'S

1. Multiple means of representation - tied to OER - Suzanne
 - a. Q&A / Discussion
 - b. 20 Q&A (2:00)
2. Multiple means of action and expression - tied to SLOs & backwards design - Amanda
 - a. Q&A / Discussion
 - b. 20 Q&A (2:20)
3. Multiple means of engagement & final wrap - tied to OEP - Suzanne
 - a. 20 Q&A (2:40)



Provide multiple means of representation:

give learners various ways of acquiring information and knowledge (text, video, audio)

OER

Provide multiple means of action and expression: provide learners alternatives for demonstrating what they know (essay, diagram, table, outline)

SLO; backwards design

Provide multiple means of engagement: tap into learners' interests, challenge them appropriately, and motivate them to learn. (authentic, intrinsic/extrinsic motivation)

OEP



UDL, SLO, OEP **the alphabet soup of good course design**

Amanda Taintor
Suzanne Wakim





Introduction to Universal Design for Learning

AKA UDL



Understand how basic UDL principles relate to Open Educational Practices, Open Educational Resources and Student Learning Outcomes



Lay the foundational knowledge for Open Educational Practices and first steps to implementation



Describe how backward design, Student Learning Outcomes and becoming expert learners are connected

Learning Outcomes



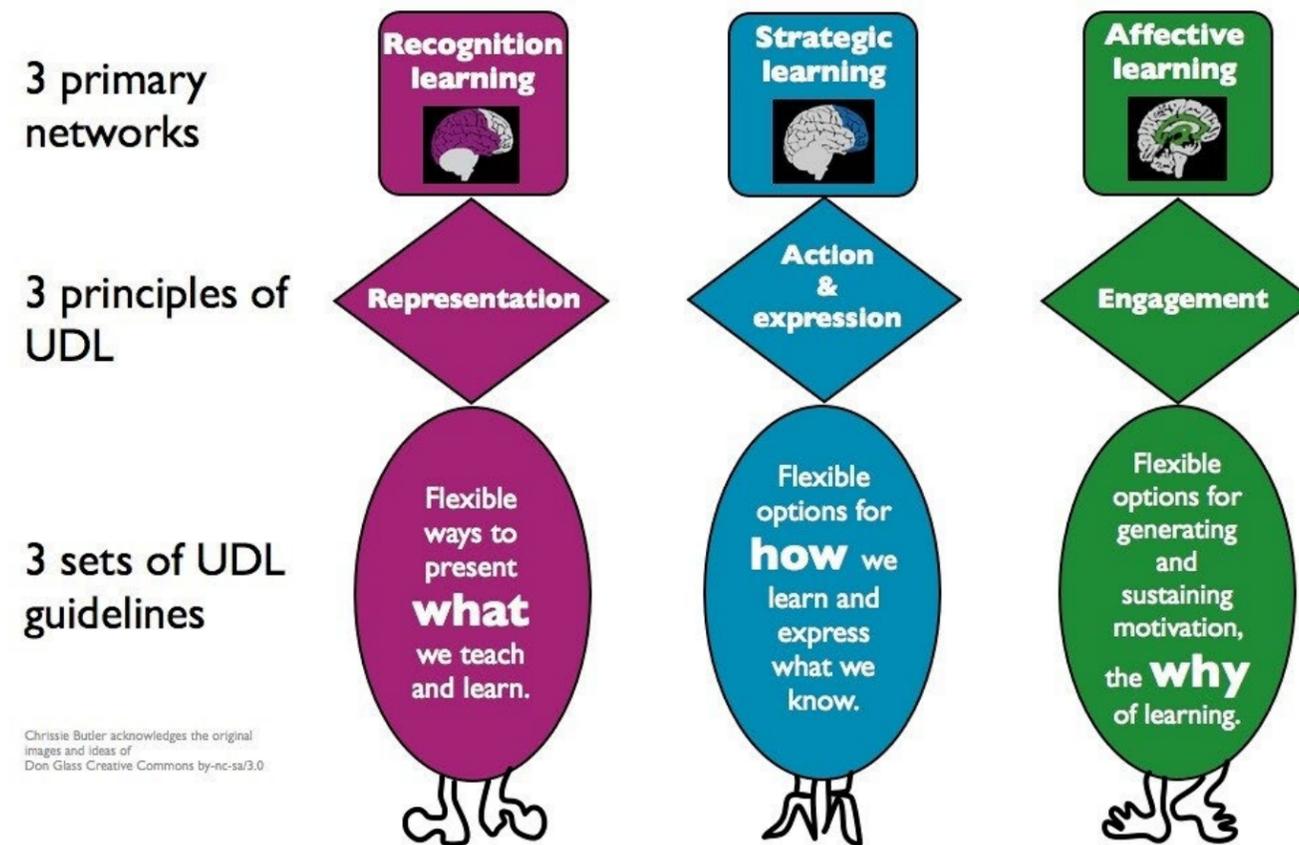


The Myth of Average.....

Image adapted from [mcmurryjulie](https://www.pixabay.com/user/14111111/) from [Pixabay](https://www.pixabay.com/)



Universal Design for Learning



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Universal Design for Learning



*“Education should help turn novice learners into **expert learners**—individuals who want to learn, who know how to learn strategically, and who, in their own highly individual and flexible ways, are well prepared for a lifetime of learning.*

Universal Design for Learning (UDL) helps educators meet this goal by providing a framework for understanding how to create curricula that meets the needs of all learners from the start.”

What is Universal Design for Learning - UDL





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

Universal Design for Learning

(<http://www.cast.org/our-work/about-udl.html>)





Provide Multiple Means of Representation

Recognition learning



Representation

Flexible ways to present **what** we teach and learn.



OER and giving learners various ways of acquiring information

Suzanne Wakim

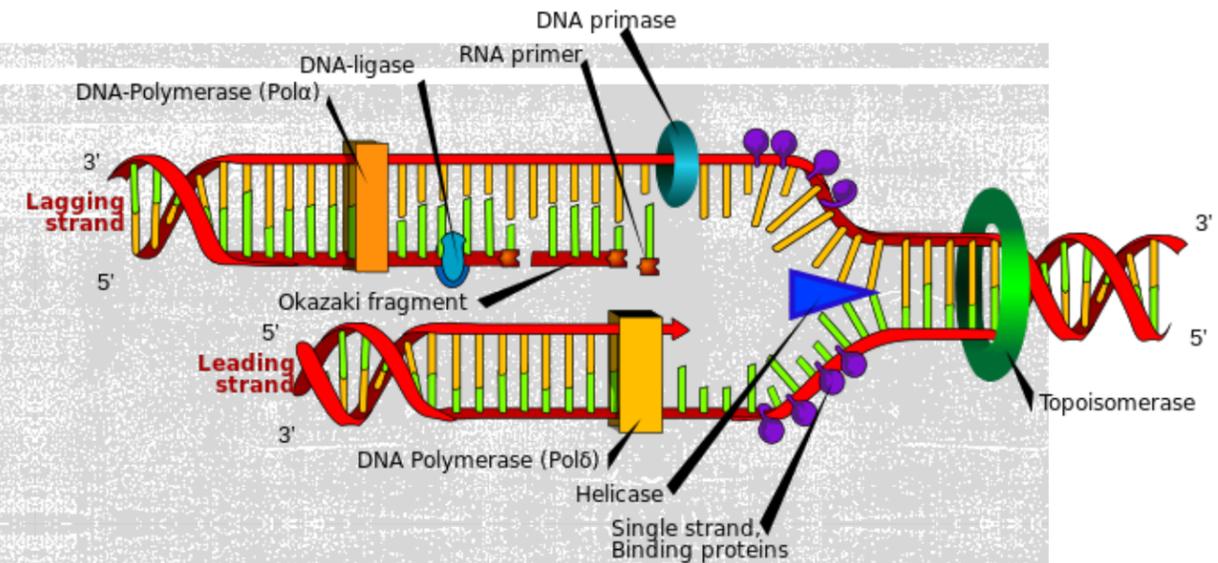
Multiple Means of Representation

The enzyme used for this process is DNA polymerase. (“poly” means many “mer” means pieces and “ase” tells me this is an enzyme). So, the name tells me this is an enzyme (“ase”) that binds many (“poly”) pieces (“mer”) of DNA to each other. There are a number of other enzymes involved in this process as well (as you can see below). Some enzymes open the DNA strand, others copy the strand, and others fill in any gaps.



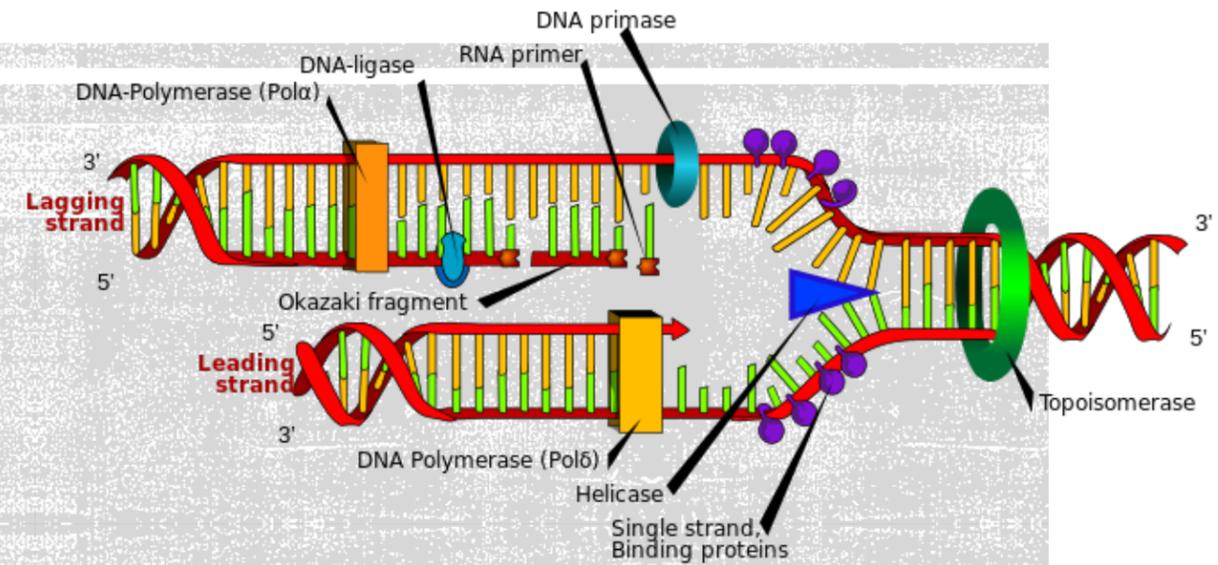
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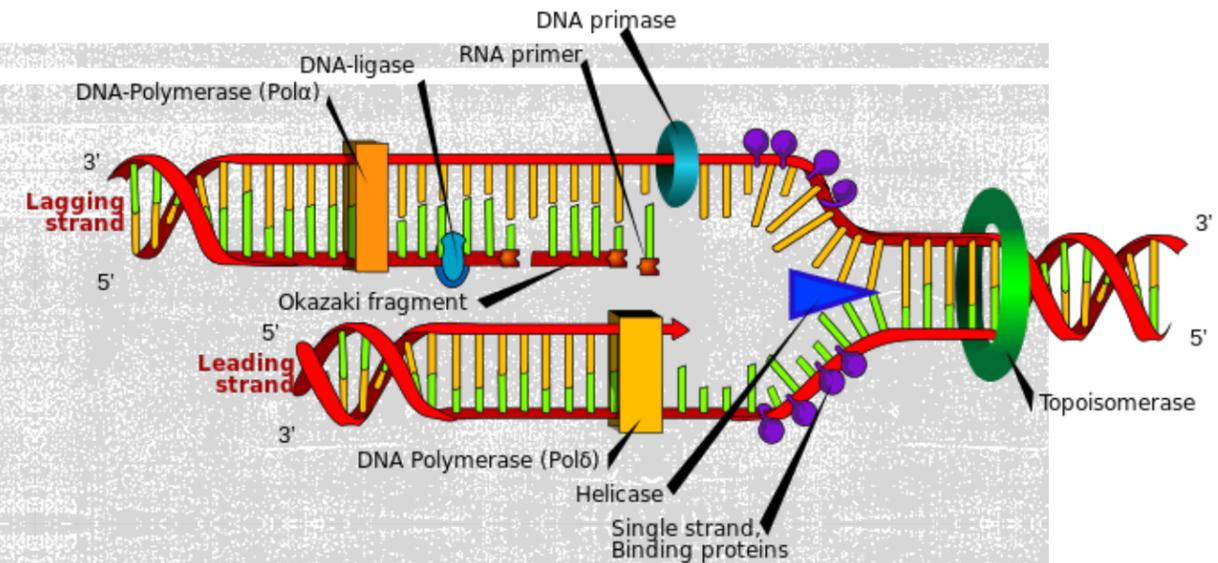
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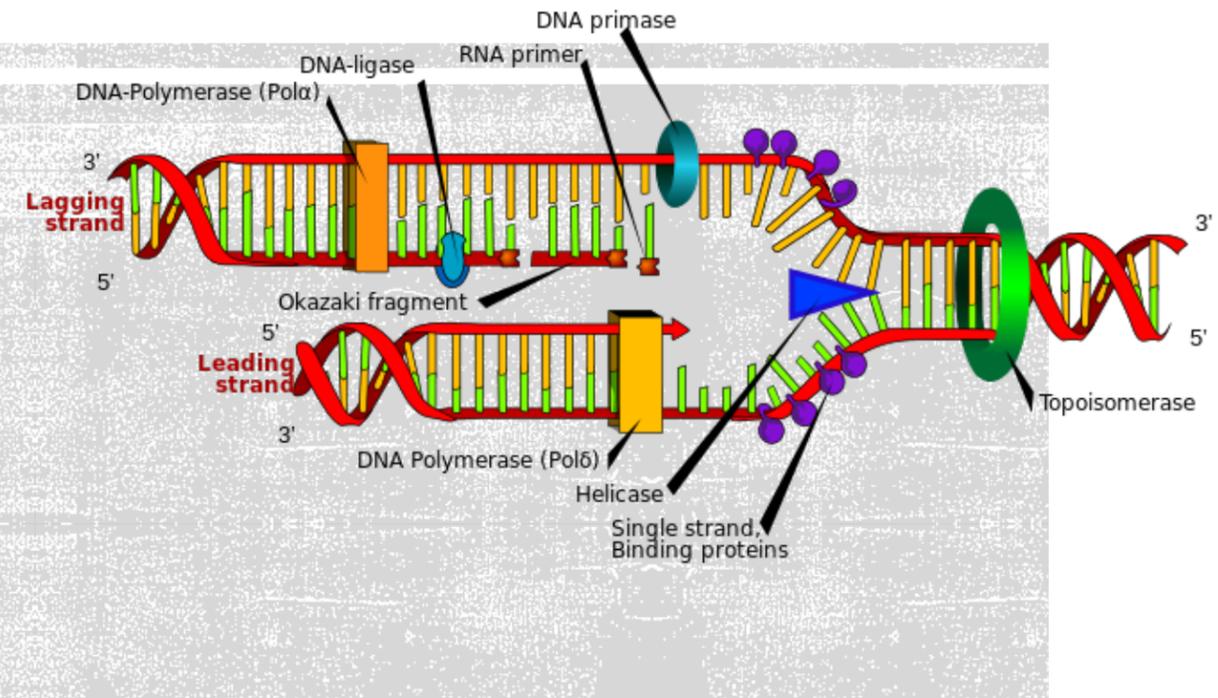


1. Helicase unwinds DNA strands
2. Topoisomerase prevents supercoiling
3. SSBP prevent reattachment
4. RNA primase adds RNA primer
5. And so on...



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		Universal G	
		U	C
U	UUU-- Phe	UCU-- Ser	
	UUC-- Phe	UCC-- Ser	
	UUA-- Leu	UCA-- Ser	
	UUG-- Leu	UCG-- Ser	
C	CUU-- Leu	CCU-- Pro	
	CUC-- Leu	CCC-- Pro	
	CUA-- Leu	CCA-- Pro	
	CUG-- Leu	CCG-- Pro	
A	AUU-- Ile	ACU-- Thr	
	AUC-- Ile	ACC-- Thr	
	AUA-- Ile	ACA-- Thr	
	AUG-- Met	ACG-- Thr	
G	GUU-- Val	GCU-- Ala	
	GUC-- Val	GCC-- Ala	

TAATGCTAGACGTTGTTCTAGGA

ATTACGATCTGCACAAGATCCT

DNA strand

The colored boxes above represent the bases in a double strand of DNA. When transcription starts, the strands separate to allow the RNA to make a copy.

1.2 Learning Links: Chemistry



Below are online sources to help you study for this unit. Remember that what you will be required to know for the quiz is the material in the study guide and worksheet for this unit. The links below will help you answer the questions, but you are not required to know everything covered in these links. I would recommend looking at many of these links as is necessary for you to be able to answer the questions in the worksheet and study guide.

Textbook Links

[CK-12 - Chemistry](#)

[CK-12 - Nutrition](#)

[Open Stax chapter on chemistry](#)

Other Links

[Khan Academy: chemistry](#)

[Khan Academy: water](#)

[Khan Academy: carbon](#)

[An interactive periodic table](#)

[Practice building an atom](#)

[Water and solutions simulation](#)

[Test your water knowledge](#)

Videos

Chemistry Basics

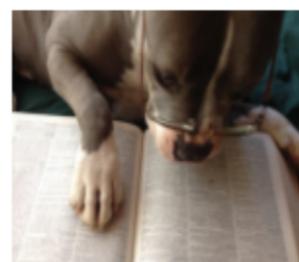
[Atomic Structures](#)



[Carbon: Crash Course](#)



1.2 Study Guide: Chemistry



What do I need to know for this week?

Study Questions:

1. Define the following terms:
 - a. Atom, molecule, organic
 - b. Polar, non-polar
 - c. Hydrophobic, hydrophilic, amphipathic
 - d. Hydrogen bond, covalent bond, ionic bond
 - e. Homeostasis
 - f. Monomer, polymer
2. Draw a molecule of water
 - a. Explain why water is polar and how this polarity results in the formation of hydrogen bonds.
 - b. What type of molecules are hydrophilic? What type of molecules are hydrophobic?
 - c. Explain why the surface tension of water allows small insects to "walk on water".
 - d. Explain why ice floats on liquid water.
 - e. Explain why charged molecules (ions) dissolve in water.
 - f. What are 2 other characteristics of water that are important for living organisms?
3. What does pH measure?
 - a. What happens to the concentration of H^+ as pH increases? What happens to the concentration of H^+ as pH decreases?
 - b. Why are buffers important?
 - c. How do buffers work?
4. List the 4 important macromolecules for living organisms.
 - a. For each explain why it is important.
 - b. Which of these macromolecules are polar and which are non-polar?
5. What is the difference between a monosaccharide, disaccharide, and polysaccharide (how many carbon rings do they have)?
 - a. Be able to identify a picture as a monosaccharide, disaccharide, or polysaccharide.
 - b. Give an example of a monosaccharide. Give an example of a disaccharide. Give an example of a polysaccharide.
 - c. Compare and contrast starch and cellulose. (Compare and contrast means discuss the similarities and differences.)
 - d. Looking at the structure of cellulose v. starch, explain why cellulose is a better structural polymer. That is, why is cellulose better for building strong structures?

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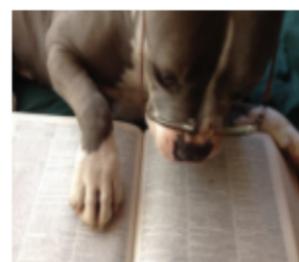


Customized OER Text

Free Resources Text and Interactive

Free Online Videos

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Curated and Customized Resources

Faculty Mode 

Library Panel

- Text 
- + 1: The Nature and Process of Science 
- + 2: Introduction to Human Biology 
- + 3: Chemistry of Life 
- + 4: Nutrition 
- + 5: Cells 
- + 6: DNA and Protein Synthesis 
- + 7: Cell Reproduction 
- + 8: Inheritance 
- + 9: Biological Evolution 
- + 10: Introduction to the Human Body 
- + 11: Nervous System 
- + 12: Endocrine System 
- + 13: Integumentary System 
- + 14: Skeletal System 
- + 15: Muscular System 
- + 16: Respiratory System 
- + 17: Cardiovascular System 
- + 18: Digestive System 
- + 19: Excretory System 

Remix Panel

- Sandbox book for testing stuff out
 - 1: Untitled Chapter 1
 - + 2: The Nature and Process of Science



The Most Important Time in Your Life?

In many cultures, marriage — along with birth and death — is considered the most pivotal life event. For pioneering developmental biologist Lewis Wolpert, however, these life events are overrated. According to Wolpert, "It is not birth, marriage, or death, but **gastrulation**, which is truly the most important time in your life." Gastrulation is a major biological event that occurs early in the embryonic stage of human development.



Figure 1 (PageIndex(1)): (CC BY-SA 3.0; by Peter van der Sluis via Wikimedia.org)

Defining the Embryonic Stage

After a blastocyst implants in the uterus around the end of the first week after fertilization, its internal cell mass, which was called the embryoblast, is now known as the embryo. The embryonic stage lasts through the eighth week following fertilization, after which the embryo is called a fetus. The embryonic stage is short, lasting only about seven weeks in total, but developments that occur during this stage bring about enormous changes in the embryo. During the embryonic stage, the embryo becomes not only bigger but also much more complex. The figure below shows early- and late-stage embryos for comparison. It is no exaggeration to say that the embryonic stage lays the necessary groundwork for all of the remaining stages of life.



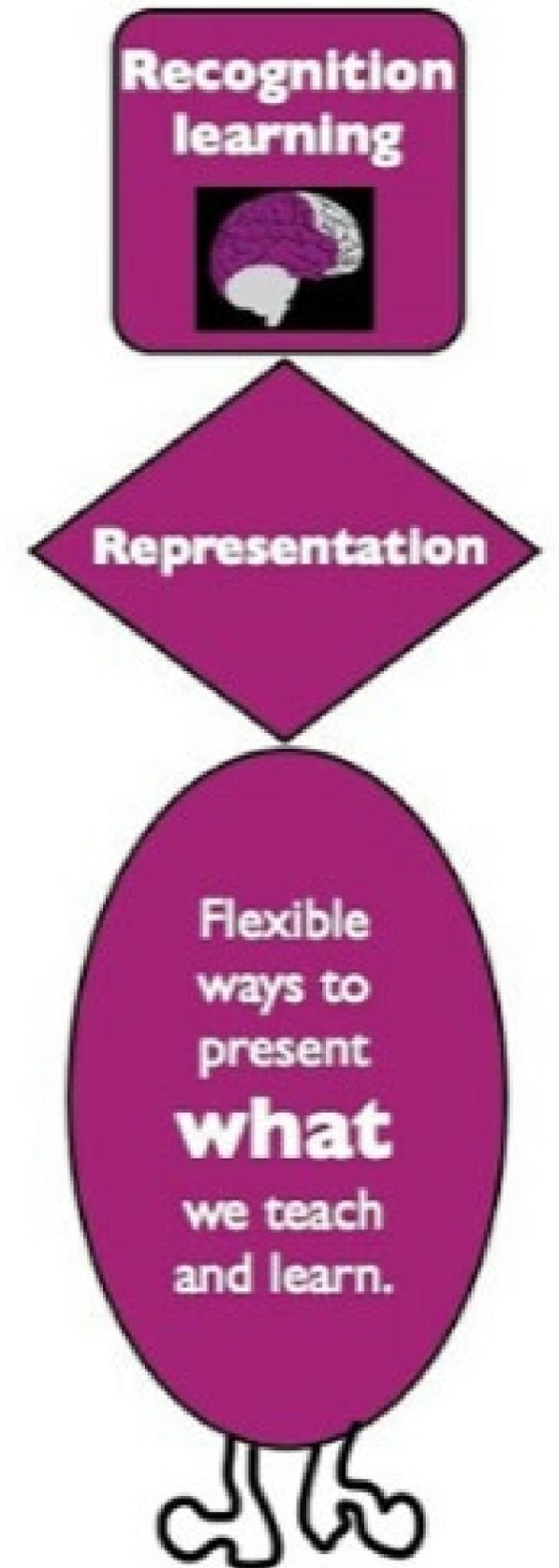
Personalize for OUR students - increase relevance and engagement



Provide Multiple Means of Representation

OER and giving learners various ways of acquiring information

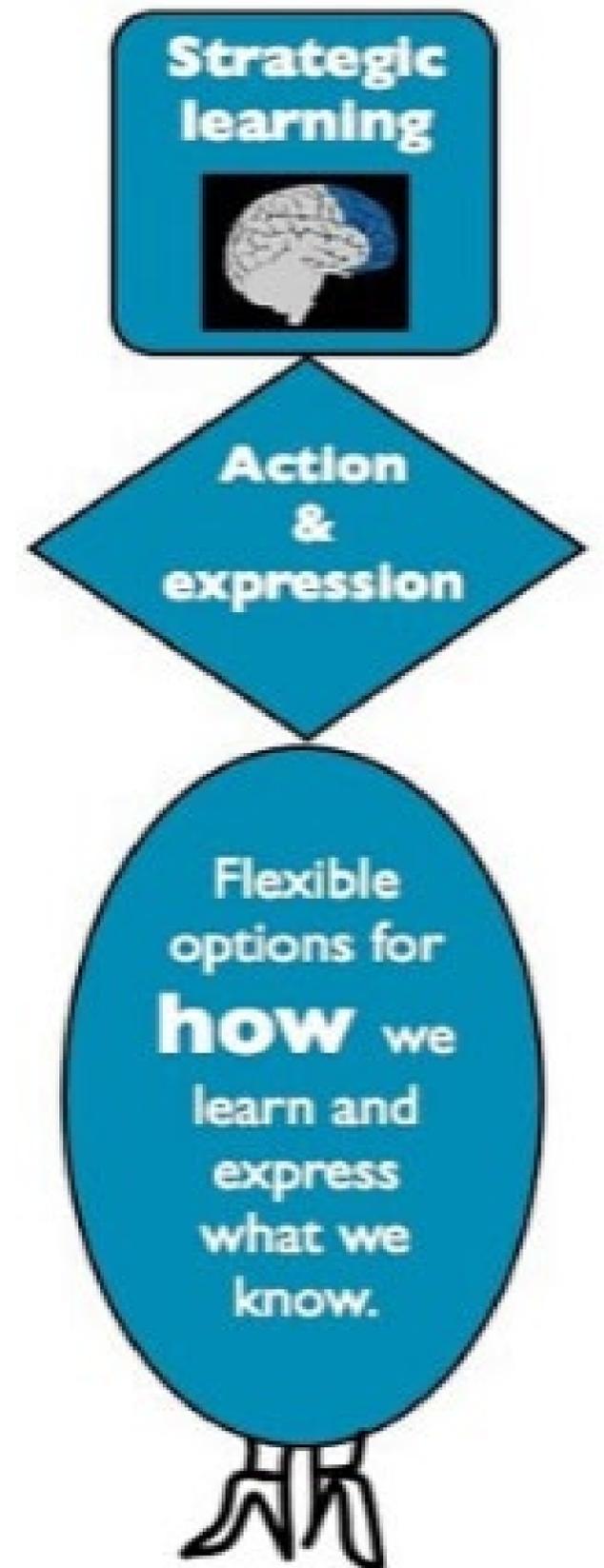
Q & A Time



Provide Multiple Means of Action and Expression

SLO and Backward Design: Flexible options for HOW we learn and express what we know

Amanda Taintor



Multiple Means of Action and Expression

- UDL emphasizes the importance of building expert learners in any context.
- To foster expert learners support relevant goal-setting
- Setting the route

Photo by [Markus Winkler](#) on [Unsplash](#)





Multiple Means of Action and Expression

- **Effective Learning Goals**
 - Separating the means from the ends
 - providing UDL options in the materials, methods and assessments
 - Addressing variability in learning





Photo by [Dillon Winspear](#) on [Unsplash](#)

Alternatives

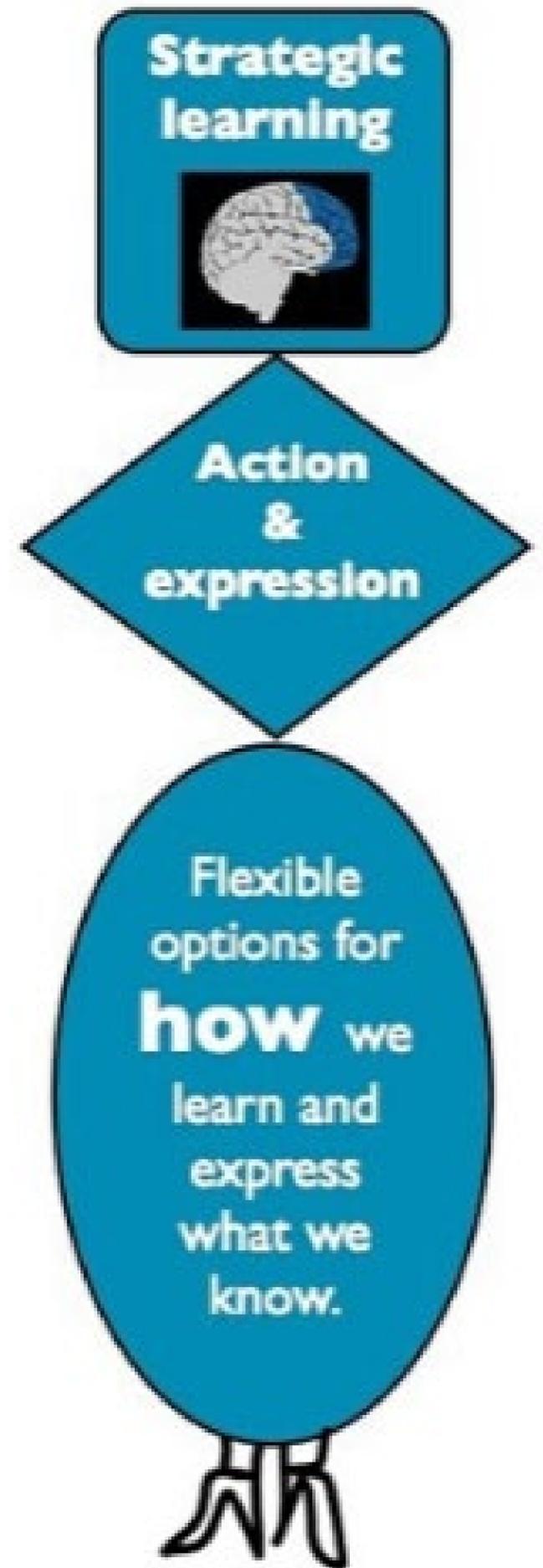
- Provide open-book quizzes: **What does a timed test assess?**
- Use a computer program, software for creating drawings, Mind-mapping software for outcome
- Demonstrate process of working a complex problem: **Allow students to take a video of themselves solving a problem and talking through their thought processes**
- Provide a choice of problems for students to complete to demonstrate mastery of a learning objective
- Co-Create assessments with students to demonstrate knowledge.
 - Students can:
 - Write questions for future quizzes, exams
- Co-Create captions for complex figures and diagrams to include in future work: **What would this demonstrate?**
- Create open-ended questions that allow creativity in response and submission type



Provide Multiple Means of Action and Expression

SLO and Backward Design: Flexible options for HOW we learn and express what we know

Q & A Time



Provide Multiple Means of Engagement

OEP Tapping into Students Interests

Suzanne Wakim

Affective learning



Engagement

Flexible options for generating and sustaining motivation, the **why** of learning.



Optimize individual choice and autonomy

Heighten salience of goals and objectives

Optimize relevance, value, and authenticity

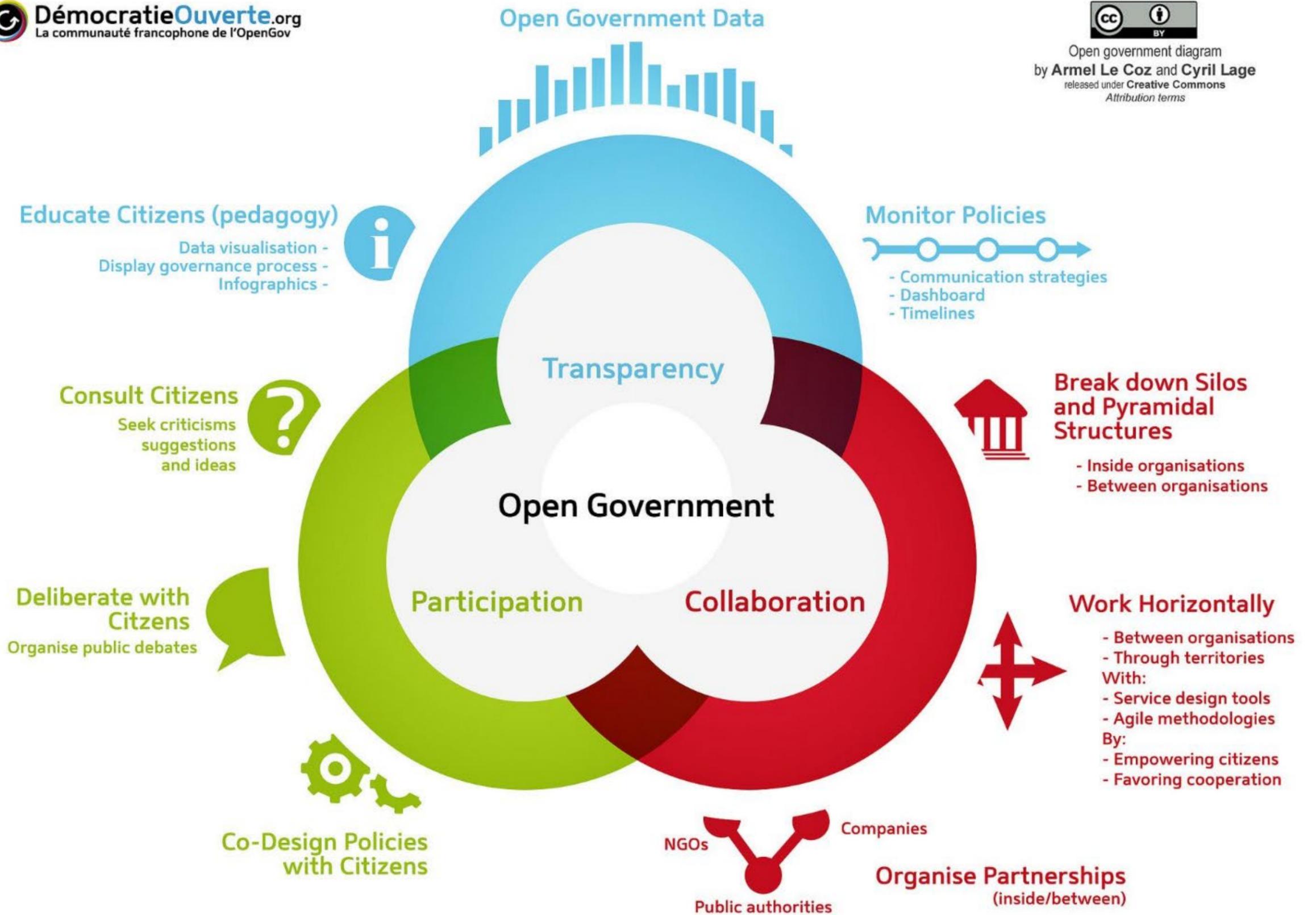
Vary demand and resources to optimize challenge

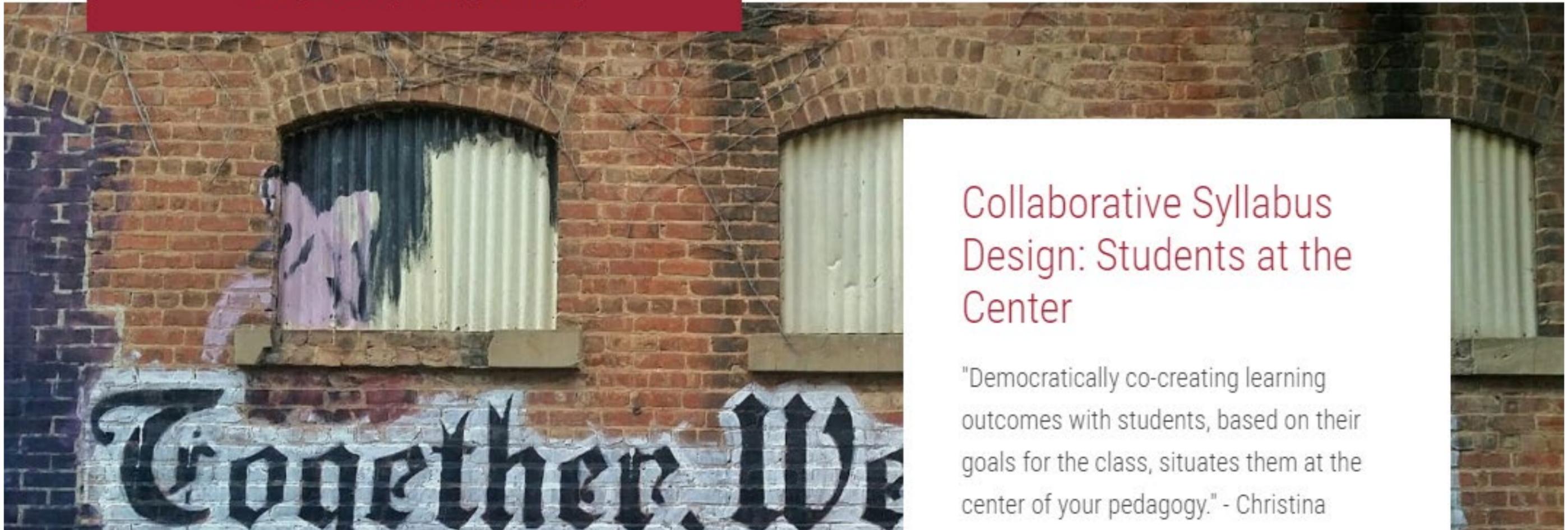
Foster collaboration and community

Promote expectations and beliefs that optimize motivation



Multiple Means of Engagement





Collaborative Syllabus Design: Students at the Center

"Democratically co-creating learning outcomes with students, based on their goals for the class, situates them at the center of your pedagogy." - Christina

Open Educational Practices - Transparency



Open Educational Practices - Participation

- Co-design the course with students
- Living Assignments



YAHOO! ANSWERS

Search Answers Search Web

Environment > Global Warming Next >

 **What causes global warming?**
what are the causes of global warming
★ 1 following 🗨️ 15 answers

[Facts on Global Warming - Search for Facts on Global Warming](#) Ads
[Ask.com/Facts on Global Warming](#)
Look Up Results on Ask.com.

Answers Relevance ▾

 **Best Answer:** Global warming is a natural phase of Earth, caused by some Solar Activities by Sun. We human don't have to bother about it. Some of the environmentalist says that this is because of the CO2 we are emitting into the environment, but the reality is that we are just contributing towards 1% to 10% of actual global warming. If the actual cause of Global Warming is CO2 emitted by the humans then why Global Warming occurs on other planets. Just Google for "Global Warming on other planets" and see the results, there are no humans on other planets.

Having too little CO2 in the environment will cause for the plants to die more early, more over it also cools down the temperature on earth.
Having too much CO2 (obviously, not caused by humans. Mostly generated in the Sea/Oceans) will lead to Green House effect and will lead in increasing the temperature on Earth.
So, the best is to plant more trees so that there would be a balance for the consumption of CO2 on the planet.

I personally think that instead of thinking on this baseless issue try to think on what if Nuclear War broke out in the world, it will destroy Earth more rapidly.

So, next time whenever somebody says you about global warming, just ignore it.

UDL-SLO-OEP

Equality



Equity



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Provide Multiple Means of Engagement

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Contact Information

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