

# **Fostering Inclusive Learning Environments - The Synergy of Generative Artificial Intelligence and Universal Design for Learning**

Lucas Wright and Afsaneh Sharif



**Located on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam) People.**



**Located on the traditional, ancestral, and unceded territory of the Sylix (Okanagan) People.**



## By the end of this workshop, you will be able to:

- Understand the core principles of Universal Design for Learning (UDL) and how they can be applied to create inclusive learning environments.
- Recognize the potential of Generative AI technologies in enhancing educational content and practices.
- Articulate the value of integrating GenAI into a UDL framework, specifically discussing at least two benefits of GenAI-UDL integration for enhancing inclusion and accessibility in educational settings.
- Demonstrate the ability to incorporate at least one GenAI-based tool or technique into a lesson plan that aligns with UDL principles.



# Inclusive Learning Environments

Environments where all students feel that their differences are valued and respected, have equitable access to learning opportunities, resources, support and are supported to learn to their full potential. These learning environments are designed to accommodate and celebrate diversity, ensuring that every student feels a sense of belonging.

-Inclusive Teaching at UBC: <https://inclusiveteaching.ctlt.ubc.ca/>



'Education is not the learning of facts, but the training of the mind to think.'

Albert Einstein

'Educating the mind without educating the heart is no education at all'

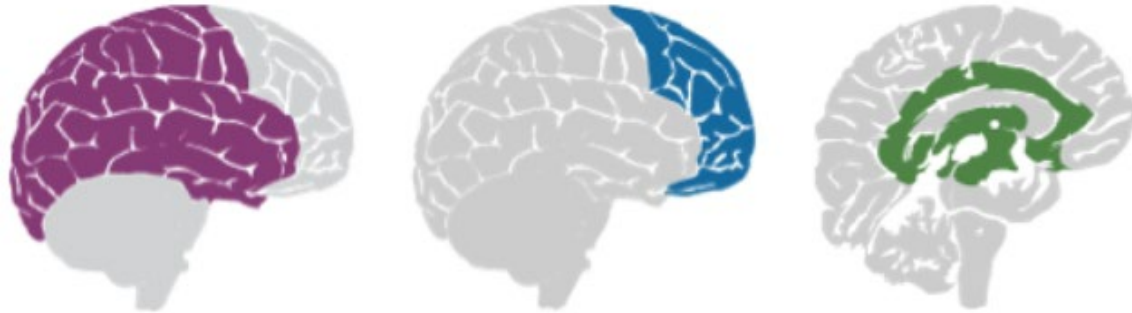
Aristotle

An aerial photograph of a large stadium, showing the tiered seating areas in shades of red, orange, and green. A blue rectangular box is overlaid on the right side of the image, containing the title text. The stadium's structure and surrounding landscape are visible in the background.

# Introduction to UDL

# What is Universal Design for Learning?

“UDL is a set of principles for curriculum development that give all individuals equal opportunities to learn.”



# Why UDL

- Promotes inclusion and belonging
- Responsive to the diversity of learning needs
- [Beyond COVID](#): the future of teaching and learning
- UBC Strategic Plan, Indigenous Strategic Plan and Inclusion Action Plan
- [BC Digital Learning Strategy Report](#)
- The goal: meeting the needs of all learners and removing systemic barriers





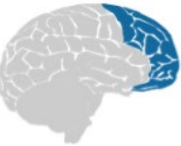
### Affective Networks

Provide multiple means of **Engagement**  
For purposeful, motivated learners, stimulate interest and motivation for learning.



### Recognition Networks

Provide multiple means of **Representation**  
For resourceful, knowledgeable learners, present information and content in different ways.



### Strategic Networks

Provide multiple means of **Action and Expression**  
For strategic, goal-directed learners, differentiate the ways that students can express what they know.

## UDL Principles for Effective Instruction

An aerial photograph of a stadium is visible on the left side of the slide. The stadium's seating bowl is green, and the field is a lighter green. A blue header bar is positioned at the top of the slide, containing the title text.

# Systemic Barriers

Systemic barriers are policies, procedures, or practices that can prevent individuals from having equal access to a service and fully participating in a situation.



## Activity on Systemic Barriers (5min)

What systemic barriers might exist in your course/faculty/discipline/practice?

# Systemic Barriers Examples

- Unclear learning outcomes
- One way assessment (i.e. summative assessment only)
- Providing information in only one way (e.g. no alternative text or media)
- Classroom/events without wheelchair-accessible tables
- Expensive textbooks and field trips
- Lack of transparency and flexibility



# **Introduction to GenAI in the Context of UDL**

# Tools and Resources

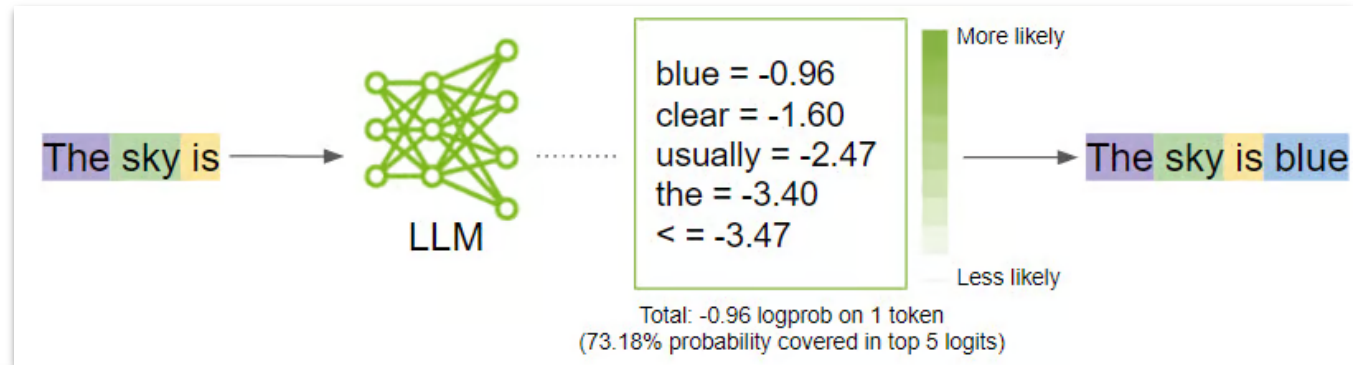
- ChatGPT
- Bing Chat (MS Co-pilot)
- Google Gemini
- Claude



**Worksheet:** Follow Along  
<https://tinyurl.com/GenAIUDL>

Generative artificial intelligence (generative AI, GenAI] or GAI) is artificial intelligence capable of generating text, images, videos, or other data using generative models, often in response to prompts. Generative AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics.

## Wikipedia





## Théâtre D'opéra Spatial





**Assign Persona:** Ask the GenAI to act as a specific persona.


**Construct Output:** Include the desired output format.

**Tailor Details:** Include specific details in your prompts.


**Offer Examples:** Train the model with examples.

**Reflect & Refine:** Ask the model to show and evaluate its work.

## A.C.T.O.R. Model for GenAI Prompting

- 
- Pay to pay inequities
  - Accessible interface issues
  - Emerging skill inequities
  - Bias

**Emerging Access issues and Barriers**



Content  
Assignments/Assessments  
Tutoring

**Personalization**



### **Image description generated by Be My AI:**

The picture shows a young woman sitting on a wooden chair in what appears to be a cozy café with wooden interiors. She is wearing a black jacket and blue jeans, and holding a white paper cup, possibly with a hot beverage. She has a somewhat serious expression on her face. To her right, there is a black Labrador dog standing on the wooden floor, looking directly at the camera. The dog is wearing a guide dog harness and looks serious. On the table next to the woman, there are condiments like salt and pepper, and a red bag of chips. The atmosphere seems relaxed and casual.



**Be My AI**

# Magic ToDo

[Help ?](#)



Breaking things down so you don't



  Study for an exam 




  Create a study schedule  

  Gather all necessary study materials  

## Goblin Tools



Leverage Custom Bots for UDL (UDLPal)



One way that we can leverage GenAI is to create personas to help us identify barriers to learning in our teaching and learning environments.

## **Persona Activity**

Dr. Amina Patel, a 45-year-old Associate Professor of Mathematics, is teaching a second-year "Advanced Calculus" course. During a session on complex integrals, she integrates interactive software to visualize problems and assigns group projects to encourage collaboration. Once a week she uses videos from YouTube for classroom discussions. She also has in class quizzes to test the understanding of materials. These are weekly and timed.



## Persona Activity: Instructor Persona



Alex Martinez is a second-year university student majoring in Mathematics. Alex is a first-generation college student. They have a visual impairment that makes it difficult to read small print and access course materials that are not screen-reader friendly. Additionally, Alex experiences anxiety, especially in large, impersonal lecture halls, which hinders their ability to participate actively in class discussions and group projects.



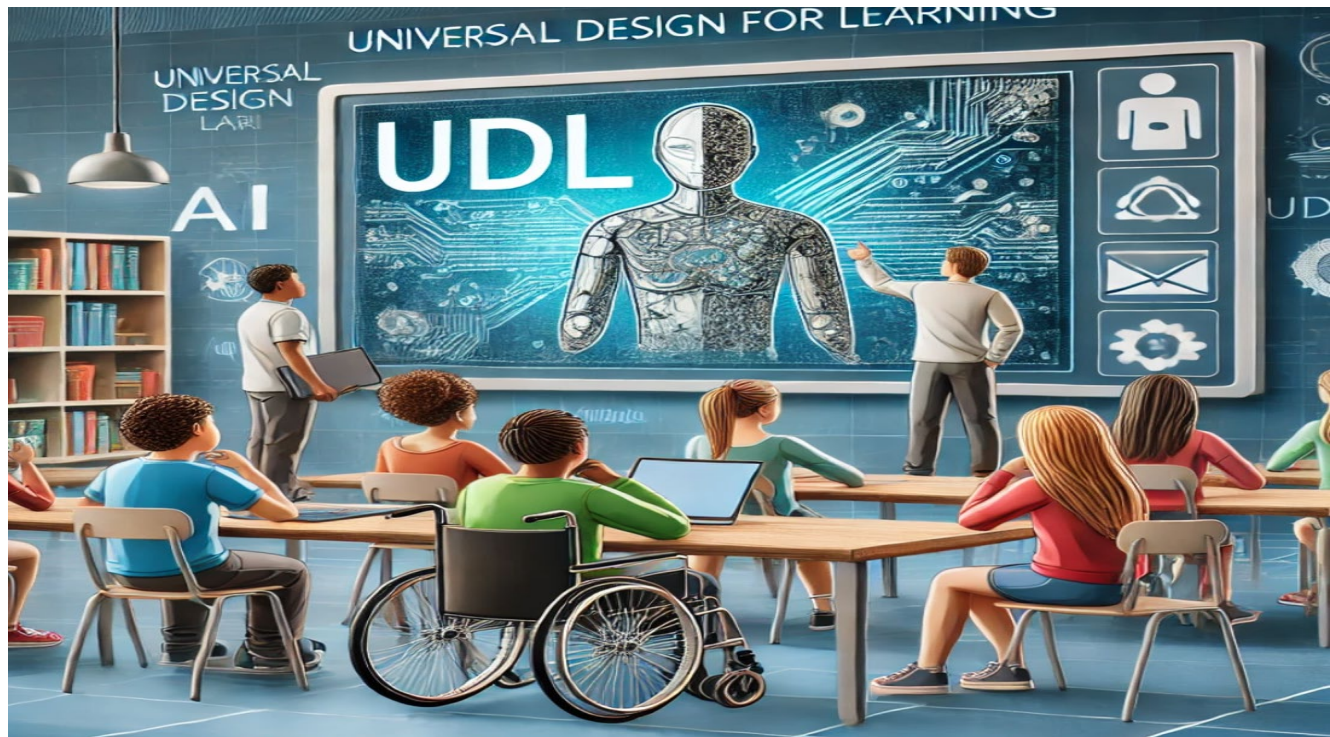
## Student Persona Example



**Do:** Using the persona prompt template create your own persona

**Reflect:** What was the quality of the persona? How could you change your prompt to improve the persona?

**Create a student persona**




## UDL and GEN AI

# Multiple Means of Representation

UDL encourages presenting information and content in multiple ways to cater to various student preferences and needs. This includes offering content through text, visuals, audio, and interactive experiences.



- 
- Provide text equivalents for podcasts and videos (e.g. captions, transcripts).
  - For your online course and resources, embed support for vocabulary and symbols within the text (e.g., hyperlinks or a glossary page, illustrations, translations).
  - Provide translation sites or links to multilingual glossaries.
  - **Use concept maps to show the link between ideas and topics.**
  - Highlight key information in text, graphics and diagrams.
  - Provide scaffolds that connect new information to prior knowledge

## Multiple Means of Representation in Action




## Caption

Figure 3.3: This image displayed the results of a field test conducted in 1942 to show the ability of phosphate to encourage plant growth. A phosphate deficiency reduces plant production. Source: the Tennessee Valley Authority

## ALT Text

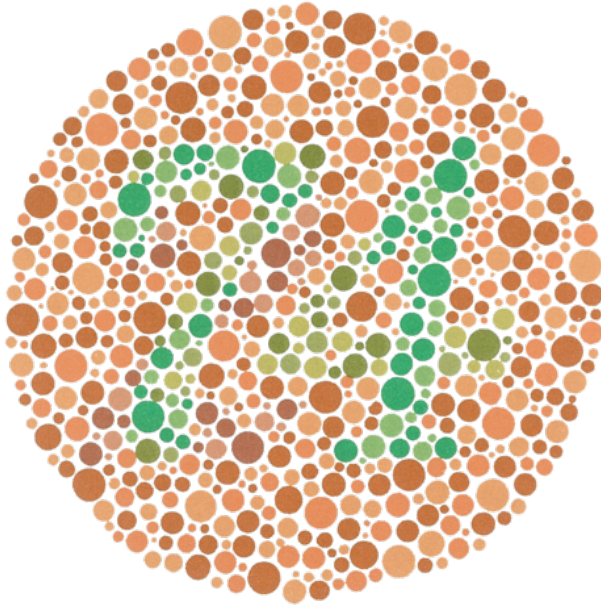
Figure 3.3: This image displayed the results of a field test conducted in 1942 to show the ability of phosphate to encourage plant growth. Two signs designate the experimental treatments. The sign on the left reads "Starved by lack of plant food". Crops here are stunted or dead. The sign on the right reads "Nourished on phosphate and lime". Crops are healthy and show vigorous growth.

**Describe your Visuals and Transcribe your Media**



“Click [here](#) for more information”  
is not as clear as  
“[Information about Teaching and Learning Fund](#) at UBC is  
available online”.

**Describe your Hyperlinks and Use Headings**



## Languages of India

Red = IE – Green =  
Dravidian

- Sanskrit
- Malayalam
- Tamil
- Hindi
- Sinhala
- Kannada
- ...

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Red = IE – Green =  
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Font Size and Colour Contrast





# Provide Multiple Means of Representation with AI



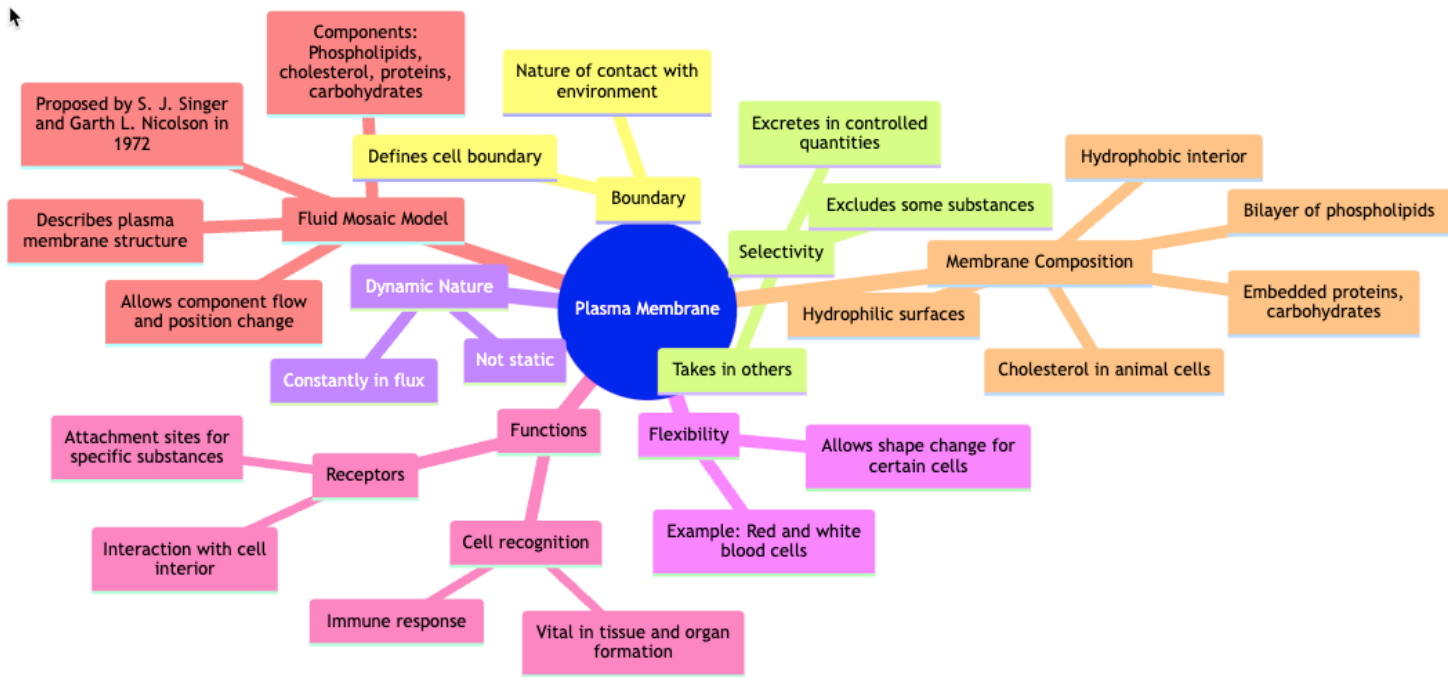


The work of the text is to literalize the signifiers of the first encounter, dismantling the ideal as an idol. In this literalization, the idolatrous deception of the first moment becomes readable. The ideal will reveal itself to be an idol. Step by step, the ideal is pursued by a devouring doppelganger, tearing apart all transcendence. This de-idealization follows the path of reification, or, to invoke Augustine, the path of carnalization of the spiritual. Rhetorically, this is effected through literalization. *A Sentimental Education* does little more than elaborate the progressive literalization of the Annunciation.

**Scaffolding and Personalizing learning- DEMO**



Alternative Text - **DEMO**



# Mindmap- Demo

## Try

Using the provided text example transform it in as many ways as possible

Create alt text for an image that is concise and descriptive (Use Copilot or GPT)

Create a mindmap with GPT 3.5/4o MS Copilot or Claude

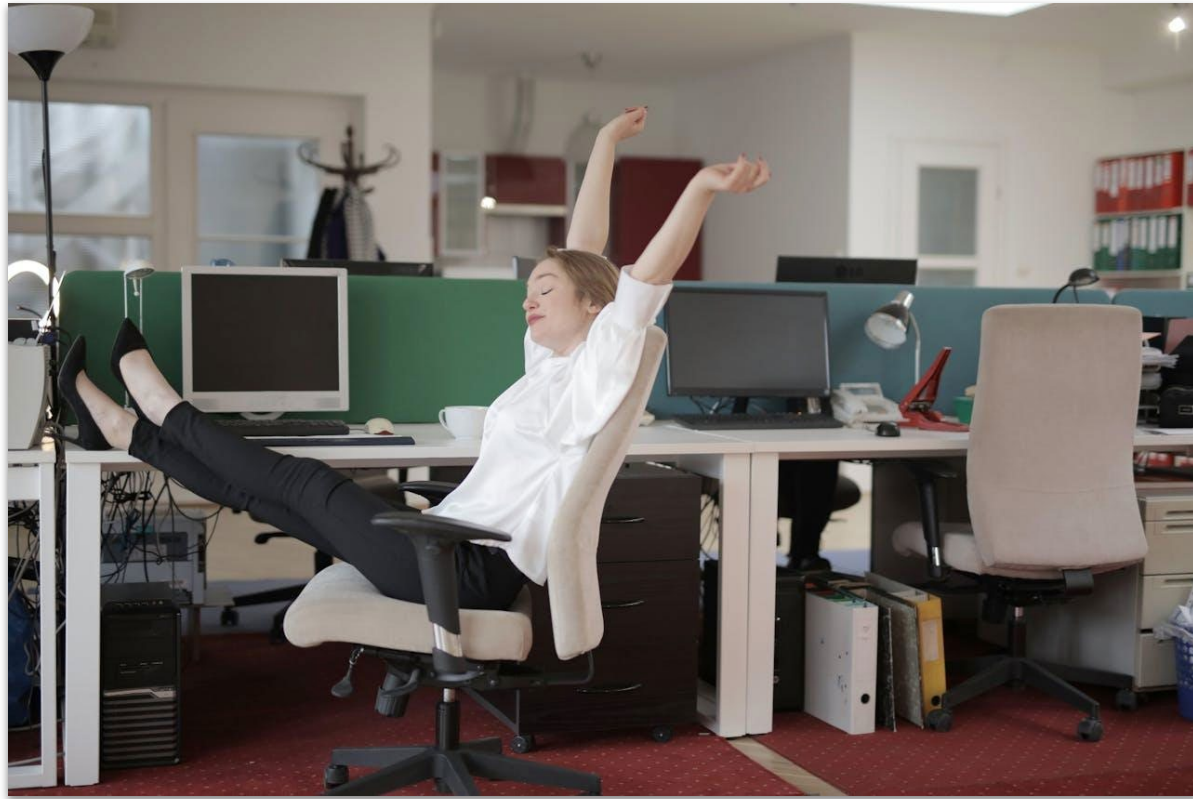
## Reflect

What was the output quality?

What approaches did you use?

Potential Uses?

# Activity 1: Representation




**Break Time**

## Multiple Means of Engagement

This principle focuses on engaging students and maintaining their interest in learning. It encourages educators to create a supportive and motivating learning environment by providing options for how students can engage with the material.



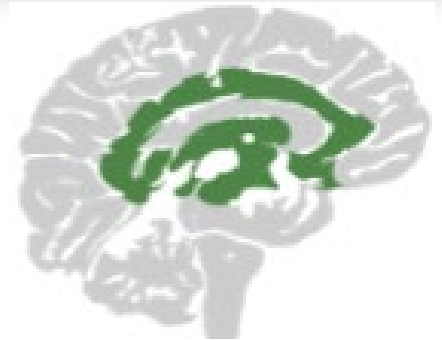
- 
- Invite guest speakers
  - Create a detailed course schedule
  - **Create rubrics** and community agreement for group work; consider involving students themselves in creating these
  - **Build in peer-to-peer feedback**
  - Allow multiple attempts on exams (when possible)
  - Ask follow-up questions after a lecture, a presentation or a video to ensure understanding
  - Provide feedback that is frequent, timely, and specific


## Multiple Means of Engagement in Action





# Multiple Means of Engagement and AI






**Prompt:** Act as a communicating science instructor with a specialization in science communication. Create a rubric to assess third year students blog posts about a citizen science project. The rubric should include the following: a specific list of criteria, gradations of quality based on the degree to which a standard has been met (basically a scale). The gradations should include specific descriptions of what constitutes "excellent", "good", "fair", and "needs improvement". Each gradation should provide descriptors for the performance level. Typically there are 4-6 gradation levels on a rubric.

## Create a Rubric

Criteria	Excellent	Good	Fair	Needs Improvement
<b>Understanding of the Project</b>	Demonstrates a comprehensive understanding of the citizen science project.	Demonstrates a good understanding of the project with minor inaccuracies.	Demonstrates a basic understanding of the project with some inaccuracies.	Demonstrates little to no understanding of the project.
<b>Clarity of Writing</b>	The post is clear, concise, and well-organized.	The post is mostly clear and organized, with minor issues.	The post is somewhat clear and organized, but has noticeable issues.	The post is unclear, disorganized, or confusing.
<b>Use of Scientific Language</b>	Uses appropriate scientific language and terminology accurately.	Mostly uses appropriate scientific language, with minor inaccuracies.	Occasionally uses scientific language, but with some inaccuracies.	Rarely or never uses appropriate scientific language.

## Create a Rubric



**Prompt:** Evaluate the following blog post based on the rubric and provide suggestions for improvement

**Peer to “Peer” Feedback**



Criteria	Score	Comments
Understanding of the Project	4	You've demonstrated a comprehensive understanding of the Backyard Bird Project.
Clarity of Writing	4	Your post is clear, concise, and well-organized.
Use of Scientific Language	3	You've used appropriate scientific language for the most part, but could include more specific terminology related to birdwatching and citizen science.
Engagement with the Audience	4	You've effectively engaged the audience and stimulated interest in the project.
Reflection on Personal Experience	2	You've mentioned your experiences, but could provide more depth and



## Peer to “Peer” Feedback

## Try

Have the model create a rubric based on your one of your activities or assignments.

## Reflect

What was the output quality?

What approaches did you use?

Potential Uses

## Activity 2: Engagement

## Activity Guide:

As a group, you will be presented with “Personas” (slides 3 and 4). (<https://tinyurl.com/FloPersona>)

- **Read** some information about a “Alex (Learner Persona)”, to become familiar with their preferences and challenges (Slide 3).
- **Read** about an “Amina (Instructor Persona)” and their course scenario (Slide 4)
- **Complete** the next three steps in your breakout room (15 minutes) and make notes in your Group slides.

## Persona Group Activity



## Persona Activity

**Step 1:** In your groups discuss what barriers to learning Alex would face in Amina's classroom and share strategies to overcome them/

**Step 2:** Adapt the barriers to learning for your own classroom. And have ChatGPT create personas for you to better understand the learning barriers students will face

**Step:** In your group discuss what personas were generated and how you may adapt your teaching or design approaches to reduce barriers to learning.

**Reducing Barriers to Learning Using AI**

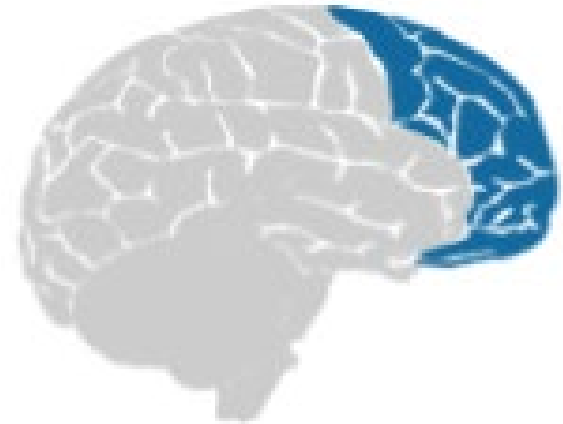





**Break Time**


# Multiple Means of Action and Expression

UDL emphasizes allowing students to demonstrate their understanding and knowledge through various means, enabling them to choose the mode of expression that best suits their abilities and preferences.

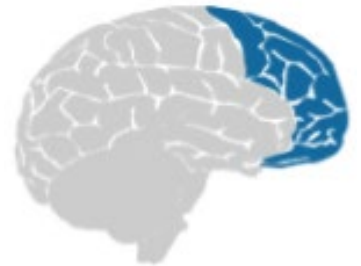


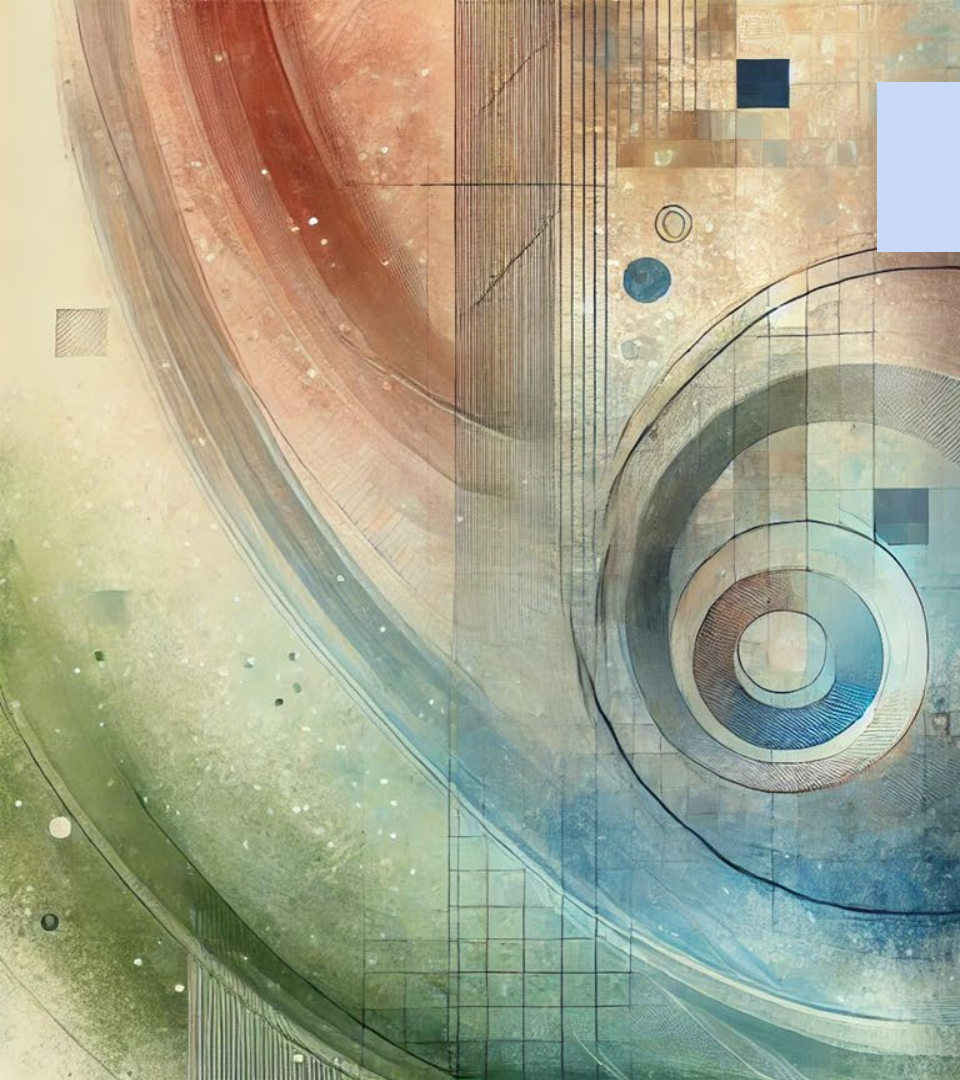
- 
- Provide options for assignment requirements to demonstrate their content knowledge differently.
  - Use multiple tools for construction and composition.
  - Provide sentence starters to prompt students to write self-reflections, peer feedback on other students' work, etc.
  - Provide multi-part assignments with feedback at each stage.
  - **Provide opportunities for mentorship from different sources.**
  - **Provide self-assessment activities with automatic feedback throughout your course where possible.**
  - Provide alternative ways of participating in classroom activities .

## Multiple Means of Action and Expression in Action

The background of the slide features a vertical strip on the left side with abstract, curved patterns in shades of red, orange, green, and blue. The rest of the background is white.

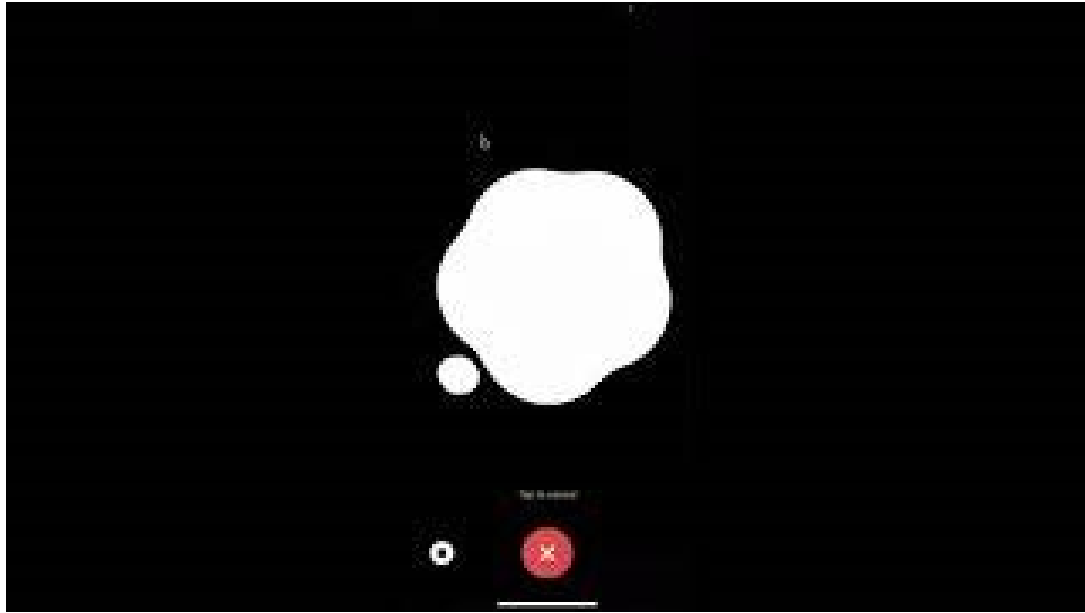
# Multiple Means of Action and Expression



The background of the slide is an abstract, artistic composition. It features a large, central circular motif composed of several concentric rings in shades of blue, green, and brown. This central element is overlaid on a grid of thin, light-colored lines. To the left, there are curved, layered shapes in warm tones of orange, red, and brown, suggesting a cross-section of a planet or a geological formation. The overall style is reminiscent of a technical drawing or a scientific illustration, with a focus on geometric forms and color gradients.

## Games and Simulations

Please roleplay as MPS 🏰, an educational history simulation game for university classes. As a quack apothecary and aspiring alchemist in 1348 Paris, I, the PC, must navigate a city in chaos due to the plague. Authentic, accurate, gritty, real feeling.



Tutor



## Try

Create a game for a topic area in your discipline. The game should involve having your play with or against the AI.

Have the model act as a tutor for you in a subject area in your discipline

## Reflect

What was the output quality?

What approaches did you use?

Potential Uses

# Activity 3: Representation



## Reflect

**One** way you could use GenAI to make your practice more inclusive


**One** challenge you anticipate in using GenAI in this context

**One** support that could help you

Share <https://bit.ly/FLOUDDL>

**GenAI and Inclusive Practice**





Any final thoughts that you would like to share?

Afsaneh Sharif, Faculty Liaison/Senior Project Manager

[afsaneh.sharif@ubc.ca](mailto:afsaneh.sharif@ubc.ca)

Lucas Wright, Senior Educational Consultant

[lucas.wright@ubc.ca](mailto:lucas.wright@ubc.ca)

**Questions and Thank You!**