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FLO FRIDAY

Inductive Learning –

Designing Activities to Learn Through Examples

Facilitator: **Annie Prud'homme-Généreux**

Hosted by Gwen Nguyen, L & T Advisor, BCcampus

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BCcampus

Learning. Doing. Leading.

Since time immemorial, the səliłwətaʔt təməx^w (Tsleil-Waututh), Skwxwú7mesh-ulh Temíxw (Squamish), x^wməθk^wəyəm (Musqueam), WSÁNEĆ (Saanich), and the Esquimalt and Songhees Nations of the Lək^wəŋən (Lekwungen) Peoples have walked gently on the unceded territories where we are grateful to live, work, and play. We are committed to building relationships with the first peoples here, based in honour and respect, and we thank them for their hospitality.

Outcomes from Session

- 1 EXPERIENCE inductive learning as learners
- 2 REFLECT on essential ingredients
- 3 CONSIDER how to implement

Agenda

Example 1

Example 2

Debrief:
What is Inductive Learning?

Wrap up




Resources Website

<https://bit.ly/FLOInductive>



FLOFriday


Inductive Learning: Designing Activities to Learn Through Examples



Inductive learning has been shown to result in greater depth and more robust (longer-lasting) learning and to help learners transfer what they learn to new situations. In this FLO Friday session, you will learn about this approach through examples, reflect on the learner experience of using this approach, and examine how to select examples to maximize the learning experience. You will formulate your own understanding of inductive learning, learn how to design activities, and refine your understanding through discussions with your peers.


WHEN: November 18, 2022, 11-12 PST
WHERE: Zoom

Annie Prud'homme-Gendreau, PhD
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Slides

You can access and download a PDF copy of the slides used in this session here.




Example 1 - What is Life?

Open these [Google Slides](#) and to go the slide that corresponds to your team number (e.g., Team 1 = Slide 3). You will find some examples of things that are alive and things that are not. Propose what is common among living things on your slide, that is absent in non-living things. Test a few hypotheses.




Example 2 - Concept Map Rubric

Examine these [examples of concept maps](#) to identify the characteristics of a good concept map and the relative importance of each criteria for quality work.




Workshop Evaluation

Please consider completing this [BCcampus survey](#) to provide feedback on this workshop and improve the this and future offerings.



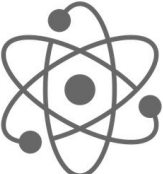


Faculty Focus Article

Here is a short (5 min read) [article that Annie wrote in Faculty Focus](#) to explain Inductive Learning and help educators consider it for their classrooms.



Activity: What is Life?

This [article published by Annie in the Journal American Biology Teacher](#), describes the activity What is Life? that was abbreviated in this session.



INSTRUCTIONS

1. Goal: Define “what is life?”

2. Go to



3. Go to your slide

4. Introduce yourselves

5. Suggest: One person shares their screen

6. Discuss:

1. What are characteristics common to all living organisms on your slide?

2. Compare your list to the non-living things on your slide.

You want characteristics of life that are unique to living things. Refine your list so that your characteristics only apply to living organisms.

3. Come back with a list of 2-3 characteristics unique to living organisms on your slide.

7. 7 min

TEAM 1

LIVING

Cactus



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Mule

(cross between horse and donkey - it is infertile)



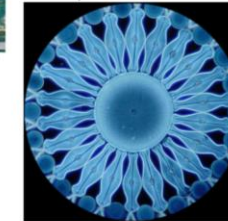
"Mule" by [united111](#) is licensed under [CC BY-NC-SA 2.0](#)

Sea Star



Diatom

(one-cell organism that surrounds itself with silicon shell and photosynthesizes in ocean)



"Diatom" by [European National Laboratory](#) is licensed under [CC BY-NC-SA 2.0](#)

NON-LIVING

Span



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Snowflake

(a complex self-repeating structure grows from one seed crystal)



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One volunteer:

Please share ONE characteristic of life that your team identified that seems to be unique to the living organisms on your slide.

If you designed this activity,
What might be important things to consider in
CHOOSING THE EXAMPLES that learners will work with?

INSTRUCTIONS

1. **Goal:** Defining quality for your mid-semester assignment (a concept map)

2. Go to 

3. Suggest: One person shares their screen


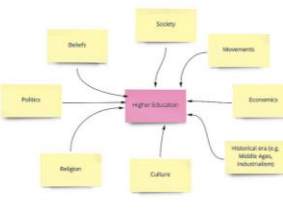
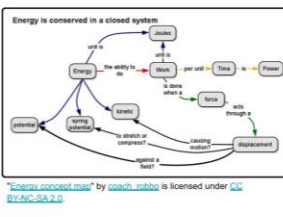
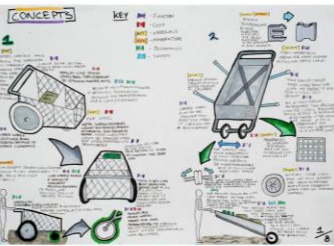
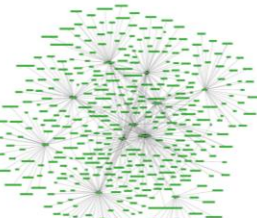
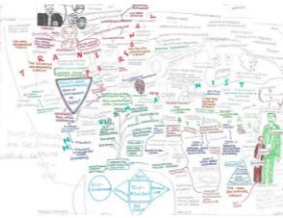
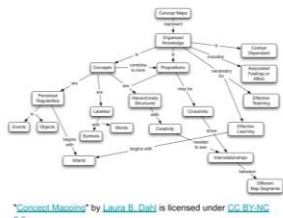
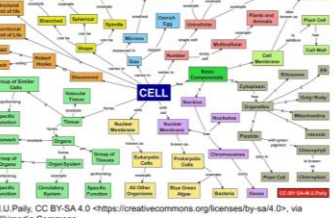
4. Compare the 8 concept maps in the context of the grades they received.
What are elements of a great concept map?
What stood in the way of the concept maps that did not earn a good grade?

5. Deliverables:

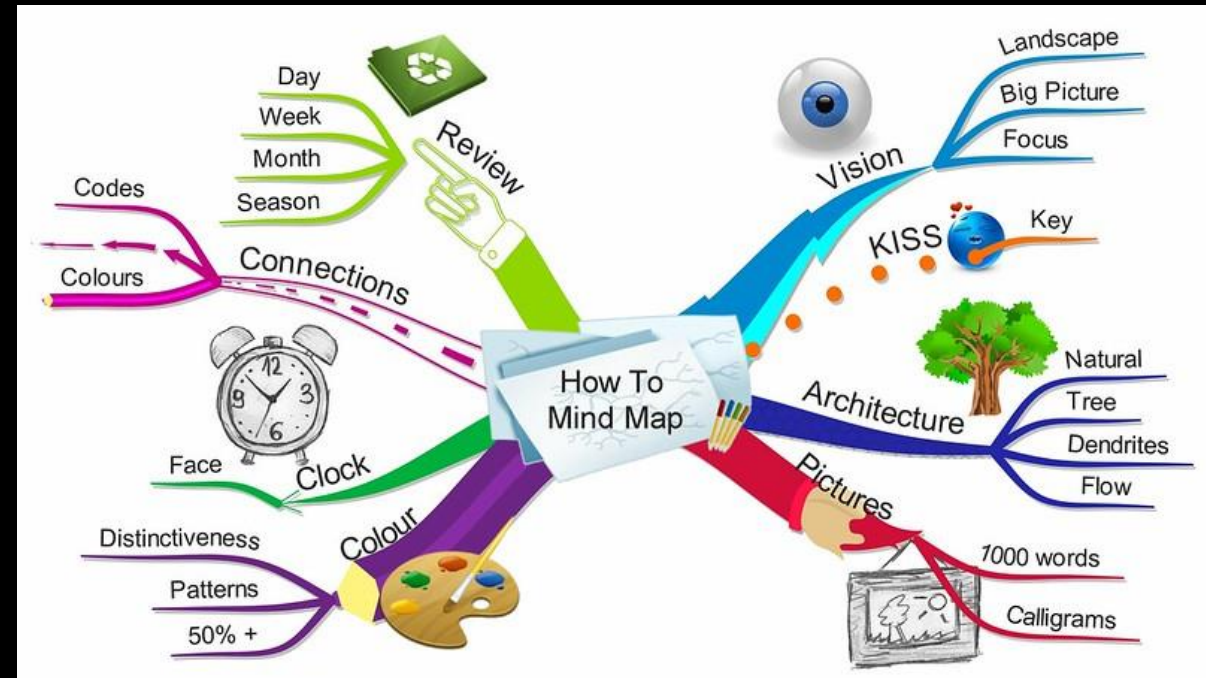
1. **LIST** the characteristics of a high quality concept map.
2. What is the **RELATIVE IMPORTANCE** of each one to creating an excellent concept map?

6. 5 min

Below are concept maps from past learners in this course, along with a grade received for the work from the instructor. Based on this information, identify characteristics of a good concept map. Discuss the relative importance of each characteristic to creating a good one.

D	C	B	A
 <p>"STEM2013 Concept Map VI" by Mehmet STEM is licensed under CC BY-NC-SA 4.0.</p>	 <p>Hedrea, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0/>, via Wikimedia Commons</p>	 <p>"Energy conserved map" by seach_rabbit is licensed under CC BY-NC-SA 2.0.</p>	 <p>"Design Assignments 2010 Higher Grade Product Design - Michael 70/70" by Jordanhill School D&T Dept is licensed under CC BY 2.0.</p>
 <p>"Wikipedia Concept Map" by jubanoo is licensed under CC BY 2.0.</p>	 <p>"concept map titled '1'" by apudula is licensed under CC BY-NC 2.0.</p>	 <p>"Concept Map" by Laura B. Dahl is licensed under CC BY-NC 2.0.</p>	 <p>M.U. Pally, CC BY-SA 4.0 <https://creativecommons.org/licenses/by-sa/4.0/>, via Wikimedia Commons</p>

Criterion	Mastery (up to 100% of grade)	Proficient (60% of grade = a passing grade)	Developing (0-60% of grade)
Complexity /10		Min. of 10 relevant concepts	
/			
/			
TOTAL /25			



1. As an instructor, how to you **KNOW WHAT QUALITY IS** in a student submission?
2. How did you **LEARN** that?

You have experienced two examples of inductive learning.

1. Based on their commonalities, how would you **DESCRIBE INDUCTIVE LEARNING**? How is it different to how learners are typically taught?
2. **TEST** your hypothesis about its definition:
Is **INQUIRY-BASED LEARNING** a form of inductive learning?
3. What are the **INGREDIENTS** for an inductive learning activity?
4. In what **LEARNING CONTEXTS** is inductive learning a good choice? Why? (when might it be worth investing the time to do this?)

Learners apply general principle to specific
examples to confirm they understand

Deductive Learning (traditional)

General Principal

(lecture, books, videos)

Experts tell learners what they know

Learning Progression

Learners **generalize observations and build abstractions**. They build their own schemas about a concept.

Inductive Learning

Learners compare examples,
make **hypotheses** about their schemas, and
test them with the examples.

Inductive Learning:

Show, Don't Tell

ADVANTAGES

From the research literature

- Deeper understanding
- Longer lasting
- More transferable

Annie's observations

- Elicits curiosity
- Confidence in abilities to think

DISADVANTAGES

- Takes time

How might you **APPLY THIS** in your own classroom?
How would it look like in **YOUR DISCIPLINE**?

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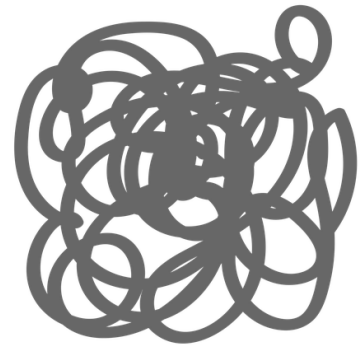
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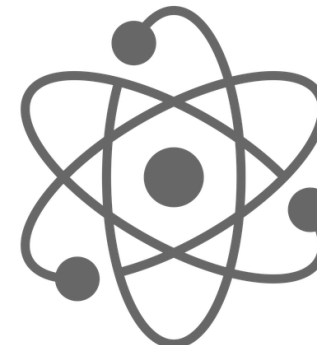
TEDx Talk by Ryan Rerby-Talbot

Ryan, a former Provost of Quest University Canada and excellent mathematics educator talks about his approach to the classroom, where he lets [students struggle with messy problems to learn larger principles](#). Some might call it inquiry-based learning, but something about learning by being "in the mess," as Ryan calls it, makes me think of inductive learning.



Activity: Nature of Science

This article describes the [Nature of Science Card Game](#) that was the basis for the second activity in this workshop.



Example 3 - Nature of Science

If you want to do the *Nature of Science* activity online (the one describe in the activity to the left), here are slides to help you do this in your class. Copy these [Google Slides](#) to your Google drive (follow the instructions). Each team can use one slide, and each person in a team can use one column.



Please complete the **SURVEY**

Provide feedback on this workshop

So that we can improve and make them even more relevant to your needs

<https://forms.office.com/r/kSgdYBgnXM>

Thank you everyone!



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