



Teacher for Learning

Scenario

Students don't seem to understand the material in my course. They just don't get it! For some reason they seem to miss the mark in my exams each year no matter what I try to do to prepare them. They just seem disinterested. I want them to understand the relevance and enthusiasm I feel for my content, but I'm out of ideas on how to get through to them.

Watch the video - How do I become a "Teacher for Learning"?

<https://www.youtube.com/watch?v=g0K7NRONiRI>

Overview



Why else do we teach but for learning? Yet, there is often a disconnect between conventional, accepted teaching practices and research evidence about what enables learning. In this module we will explore how we learn and what we can do to ensure learning environments are effective. As we extend our knowledge, we will consider strategies for designing significant learning experiences that are grounded in and informed by research principles that foster student learning in specific contexts.

Outcome

Design effective learning activities and experiences that are grounded in research-based principles of learning

Objectives

- Reflect on core beliefs about teaching and learning and the ways they impact teaching practices.



- Examine [teaching approaches and strategies](#) that foster student learning in specific contexts.
- Identify considerations when designing significant learning experiences grounded in and informed by research-based principles.

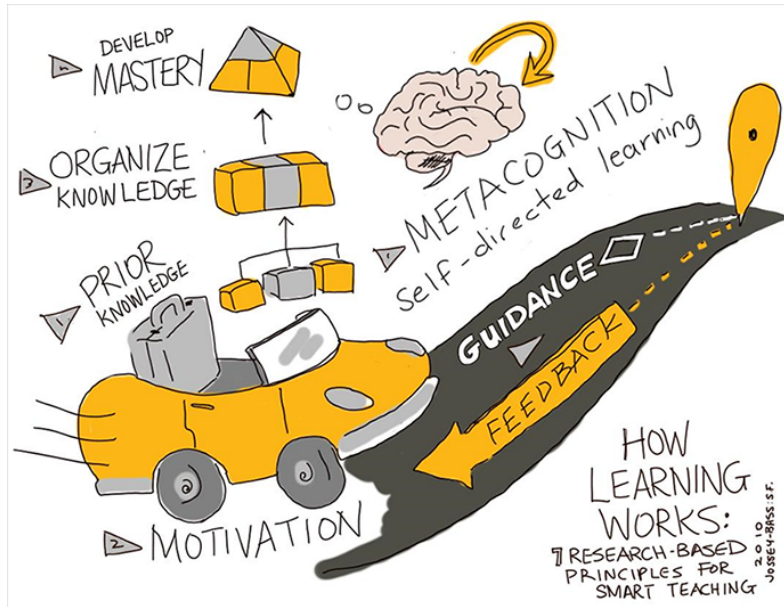
How Learning Works

This module is based primarily on the excellent book by Susan Ambrose and colleagues, [How Learning Works: Seven Research-Based Principles for Smart Teaching](#) (2010). Jossey-Bass: San Francisco.

*“Learning results from what the student **does and thinks** and only from what the student **does and thinks**. The teacher can **advance learning** only by influencing what the **student does to learn**.”*

– Herbert A Simon

- The seven principles are:
- Students’ **prior knowledge** can help or hinder learning.
- How students **organize knowledge** influences how they learn and apply what they know.
- Students’ **motivation** determines, directs, and sustains what they do to learn.
- To develop **mastery**, students must acquire component skills, practice integrating them, and know when to apply what they have learned.
- Goal-directed **practice** coupled with targeted **feedback** enhances the quality of students’ learning.
- Students’ current level of **development** interacts with the social, emotional, and intellectual **climate** of the course to impact learning.
- To become **self-directed learners**, students must learn to monitor and adjust their approaches to learning.



Prior Knowledge

We know without a doubt that the single most important thing your students bring to class is their prior learning and experience. This knowledge is a special kind of baggage that can either contain essential building blocks to advance toward mastery or be a heavy weight that slows down learning.



Prior knowledge can help or hinder learning

Help: Using students' own experiences to generate examples helps learners to make connections and increase retention. Examples include scaffolding learning from earlier classes and experiences.

Hinder: Insufficient, inaccurate, or incorrect information can slow or halt learning. For example, you may have heard of the famous physics education study where scientific misconceptions persist even in [Harvard graduates](#) about why we have seasons or whether a feather dropped from a height would fall slower than an anvil that is dropped. Even after having learned and



been tested, students persist on reverting back to “intuitive” stances about scientific misconceptions, which ultimately can hinder any potential learning that would need to scaffold onto these basic grade school concepts.

Strategies to determine and acknowledge students’ prior knowledge

You can identify some common misconceptions in your discipline by considering your student’s prior learning and connecting new knowledge to prior knowledge.

Determine your students’ prior learning

- Use diagnostic assessments such as self- and peer assessments, brainstorming, and mind maps. Look for patterns among the students’ responses.

Connect new knowledge to prior knowledge

- Be explicit about connections.
- Link between courses.
- Links within courses.
- Links to students’ own knowledge and experience.

Extend Activity

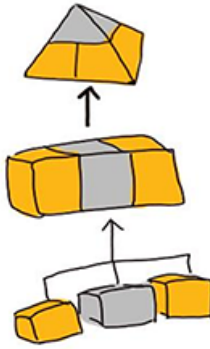


Identify a concept that is often misunderstood in your discipline. Can you think of an analogy that can help make the concept make sense to students?

Organize Knowledge

The way we present information and how we subsequently categorize new knowledge can make dramatic differences in our students’ learning. We can help learners to make sense of new information by being explicit about how we suggest information fits with prior knowledge.

extend



Play this game that shows how organization matters

(Modified from: Fink, D. (2015) Creating Significant Learning Experiences. STLHE, Vancouver.)

1. Count all the vowels on the next page.



- Dollar bill
- Dice
- Tricycle
- Four-Leaf Clover
- Hand
- Six-Pack
- Seven-Up
- Octopus
- Cat Lives
- Bowling Pins
- Football Team
- Dozen Eggs
- Unlucky Friday
- Valentine's Day
- Quarter Hour



2. How many vowels did you count

3. How many words do you remember?

This activity often generates a lot of groans. Participants want to succeed so much in the task assigned the first time that they barely pay any attention to the words themselves. When they are asked to shift and remember words, they are frustrated because they feel misled.

4. Now look at the words again.

Did you notice the pattern of organization: that each word is associated with a number?

5. Try the game again.

How many words did you remember this time?

Most people remember more words the second time they play the game. There are three reasons for this. First, they knew what the real task was by being provided the criteria for success. Second, the information was organized in a way to aid memory. Third, they were given more than one opportunity to practice remembering.

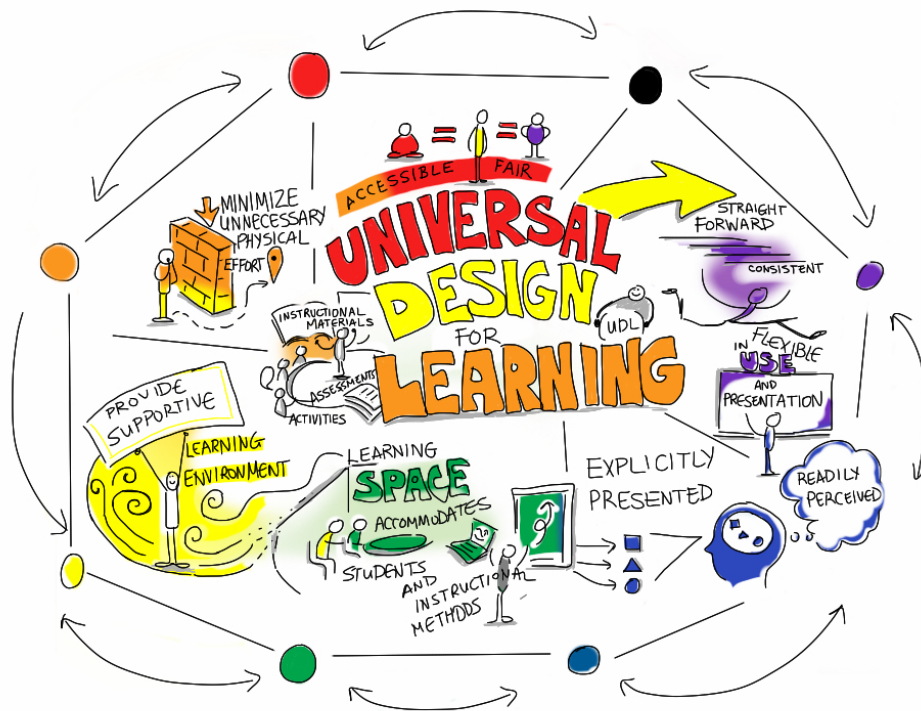
This simple game covers a great deal of the seven evidence-based principles for learning that are discussed in this module.

Strategies for organizing information

Consider Universal Design for Learning

Universal Design for Learning acknowledges that there is great variation in how individuals learn. Two major points of Universal Design for Learning:

- Learning should be designed to be accessible to everyone
- Information should be conveyed in a variety of ways, known as “multiple means of representation.” For example, instead of using just a wall of text, consider adding some visual elements. If you do add an image you should explain it using the description tag available online. Sometimes a video is the best way to explain something, but if you use video, be sure to always include transcripts and captioning. (The information about [Universal Design for Learning](#) goes into great depth about this).



Mind mapping

While common in elementary schools, mind mapping or concept mapping is used less frequently in higher ed. However, mind mapping has been found to be an effective means of helping students organize new learning. Some studies have found that using mind mapping as a learning [strategy facilitates memory and critical thinking](#).

If you're still not convinced, check out [The Theory Underlying Concept Maps and How to Construct and Use Them](#).

Keep in mind that mind maps are not just good for students, they are great for teachers too. When planning your course, you could use a mind map to decide what to include and how they are connected. Share it with students so they can get an overview of how you see your course fitting together. Using mind maps to outline your course syllabus not only models how to organize information but also adheres to the universal design principles of conveying information in multiple modes (Biktimirov, 2006).

extend

Extend Activity



Create a concept map of your course syllabus

Offer a partial graphic organizer

Instead of providing your complete lecture notes on the LMS, consider offering a partial graphic organizer that highlights some of the key learning. You can ask students to write in important facts to create the full picture. [Robinson, 2006](#) describes how using partial graphic organizers can aid in learning.



Provide opportunities for better note-taking

Try Cornell Notes. Take a look at this video on how to take Cornell notes:

<https://www.youtube.com/watch?v=WtW9lyE04OQ>

- ✓ Split your page so that it looks like Cornell notes
- ✓ Take notes that make sense to you in the right-hand (two-thirds) space.
- ✓ When you are done, use two different colour markers to highlight key points and new or specialized vocabulary. Use the left-hand (one-third) space to rewrite those key points and vocabulary with explanatory text.

A Quick & Dirty Guide to Cornell Note-taking Method

File: _____ Date: _____
 Name: _____
 Title: _____

Essential Question: **What is the essential question or theme this lecture explores?**

Questions/Key Ideas	Notes
<p>② Draw a 2-3" margin (1.5-2 cm) from left edge.</p> <p>Use this space to identify key ideas.</p> <p>Record these as questions to help you study later!</p> <p>Don't worry about your handwriting! Just get the ideas down.</p>	<p>Use this space to record your lecture notes.</p> <p>Use shorthand, symbols, lines, colour, abbreviations, your own shorthand to help you capture information.</p> <p>DO Listen to the prof! Don't just copy down what is on the slide.</p> <p>Use lecture slides as a guideline, but don't rely on them completely - your notes will be incomplete.</p> <p>DON'T try to record every word the prof is saying. Listen for important information and record it in your own words. Use point form, symbols, abbreviations, etc.</p> <p>DON'T PANIC! If you come out of notes in panic, leave in space and keep going. The prof may repeat the point later or you can check with a friend after class.</p>
<p>③ Summarize</p> <p>Draw a 2-3" margin from bottom edge.</p>	<p>After class, record a 2-4 sentence summary of your notes. This will reinforce your learning of key concepts.</p>

IDEAS FOR NOTE-TAKING SYMBOLS

+ for - for < for > for ~ for ~ for ~ for	= for < for > for ~ for ~ for ~ for	= for < for > for ~ for ~ for ~ for
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Here is a .pdf version of the Cornell Notes image

Allow time to process

If we want our students to succeed it is ideal to model successful behaviours that have been shown to be beneficial to learning.

It is well known that students who take the time to review their notes do much better than students who do not. With that in mind, use the last 10 minutes of your lecture time to allow students to process what was just covered. Doing so has two main benefits: it encourages you to think about the main learning you hope to cover during your lecture, and it allows students to immediately retrieve, use, discuss, and question what they have just learned.



You can follow this pattern to organize the 10-minute processing time, allowing about two minutes for each step:

- Ask your students what they think would be a good exam question based on the lecture they just heard.
- Ask your students to flip their page over and draw a picture that represents a key idea.
- Have your students turn to a neighbour and share their Cornell notes.
- Ask them to compare their proposed exam questions and drawings. Can they answer each other's questions? Do the drawings make sense to each other?
- Finally, and possibly most importantly, ask the students what questions remain.

You will find that structuring the end of your lecture in this way is more effective than simply asking the students, "Do you have any questions?" Students often interpret that question as a signal that it's time to pack up their binders and backpacks. In contrast, the summarizing time and activities makes the students' thinking visible and provides an immediate opportunity for students to confront any misconceptions.

Extend Activity



Try watching a TED Talk or conference keynote video yourself to practice your own note taking skills using Cornell Notes

Motivation

- What drives you to do something? What drives learners? Often we expect our learners to share our enthusiasm for a topic and they just don't seem to muster the same level of excitement. Sometimes they don't even show up.



- Motivation is a complex topic that has been studied in many contexts and has many variables. However, there are a few things you can do to make stronger connections for students to motivate them to learn.
- Motivation can determine, direct, and sustain what students do to learn. Consider the acronym WIIFM (what's in it for me?). You can use WIIFM as a helpful lens to consider your students. After you have ascertained their prior knowledge, you are better able to frame new learning in the context of their experiences and past learning.
- Always consider why your learners would be interested in learning something. What is the relevance for them? How will it connect to future activities in this class or beyond?

Extend Activity



Brainstorm a list of WIIFM from a student perspective.

If you can't think of more than "because you should know it," then you need to talk to your students and get a better sense of where they are in their learning and where they are going. If you know your students well but you still have a hard time determining the relevance of a topic, perhaps you should consider removing this content from your course.

Mastery

One of the most difficult aspects of deconstructing the skills and concepts associated with achieving mastery occurs when dealing with "threshold concepts." These are often essential



concepts in the discipline that must be understood in order to achieve mastery but are extremely challenging because once you fully understand them it is almost impossible to conceive of the topic without them. This is often described as an “expert blind spot.”

If you have an expert blind spot, it’s difficult to break down the concept into its component parts because your thinking has been irrevocably transformed. It’s our role as educators to try and remember what it’s like to be a novice learner.

The book [Threshold Concepts and Transformational Learning](#) addresses these concepts, as described by faculty with expertise in several disciplines ranging from economics to electrical engineering, modern languages to mathematics. The scope of these concepts is too great to detail in this module, but we can consider the simple example of learning how to drive a car.

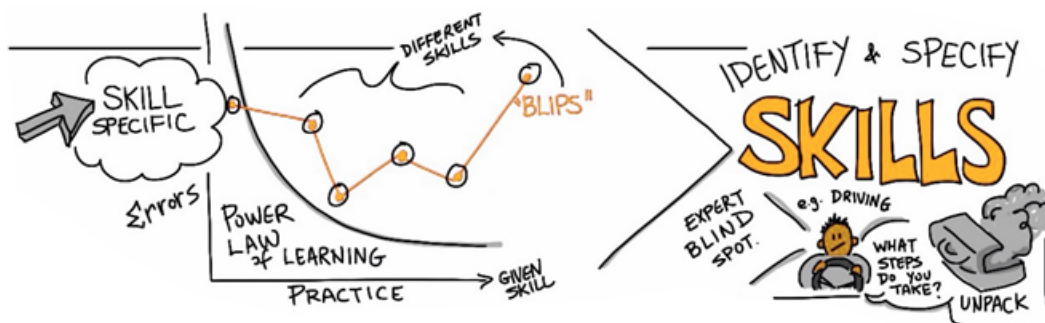
To learn to drive, you require many component skills, including knowing where the gas and brake pedals are and when to use them, how to steer, when and how to use your mirrors, all while following the rules of the road. Experienced drivers find it very difficult to think of each component separately, not as a whole. They drive with a level of automaticity, knowing their reflexes will apply each component as needed.

Learning the component skills to achieve mastery is crucial in any classroom discipline. For example, in economics, physics, or chemistry, the application of a formula can be more easily learned if simple calculations like addition and multiplication have first been mastered so that no cognitive overload occurs. Having the component skills in place allows the learner to focus on the larger conceptual problem.

Extend Activity



What concept in your discipline is like driving a car? Can you identify the component skills required to master this concept or skill?



Feedback and Practice

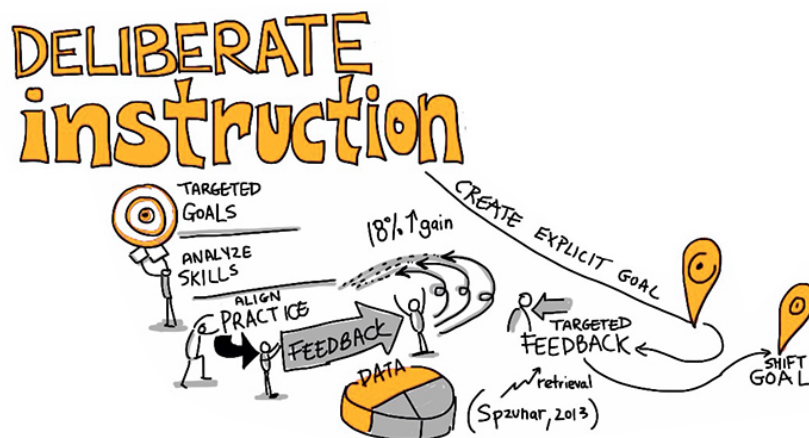
The principle of goal-directed practice and feedback refers to students needing numerous opportunities to work toward the goals that have been set and to receive explicit feedback. Feedback is most effective when it is provided at the right time for the learner. Often we design our assessments at the end of the learning to measure the final product, and we do not provide sufficient opportunities to scaffold learners toward the goal. The latter is known as formative assessment and can be immensely beneficial to you as a teacher in determining if your learners are on track. It is even more important for your learners to discover for themselves about how well they are doing and how they can improve in particular areas.

In-class strategies

Here are some strategies for applying formative assessments:

- Use the “one-minute paper.” Ask your students to write on an index card (or the equivalent online document) what their most significant learning was for a lesson, module, or even a lecture.
- When the goal is acquisition of factual knowledge, chunk your assessments into smaller, more frequent quizzes to allow students the opportunity of experiencing test-taking in a setting with lower stakes than the typical midterm exam.
- When creating written assignments, consider designing the assessment to include draft revisions. This could be done by frequent writing activities in discussion board forums, creating an annotated bibliography, using mind maps, or asking for weekly reflections.

Deliberate instruction is the act of always considering your desired outcome and intended learning for your students, and then working backwards in your lesson planning so that students can successfully achieve that goal.



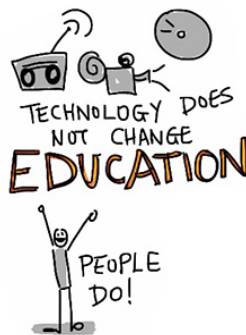


Climate of the Course

The social, emotional, and intellectual climate of the course and the classroom has an impact on learning. You can promote positive climate in your classroom by:

- Providing opportunities for small-group learning and interaction.
- Listening carefully.
- Offering opportunities to be heard.
- Providing an environment that makes uncertainty safe.
- Examining your assumptions.
- Being respectful and inclusive.
- Considering cognitive, psychomotor, and affective domains.

These factors that promote a healthy classroom climate will vary depending on the people involved. It's always best to establish ground rules for your class right from the outset so that the classroom climate standards are co-constructed and meaningful to the group as a whole.



What does a positive classroom climate look like online? As you will see in other modules, the [Community of Inquiry](#) is a helpful framework. Beyond just presentation of content, described as the “cognitive presence,” it is also important to balance and consider social and teaching presences.

Extend Activity



Create an introductory activity connected to your discipline to get to know your learners. For example:



- In a human geography class you could ask every student to describe their favourite place.
- For earth science the question could be “What mineral would you be based on hardness? Why?”
- For English literature, each student could discuss what fictional character they would like to invite to dinner, and why.
- In history, ask what figure, living or dead, would be the most interesting to have at a cocktail party?

Can you think of some fun and interesting questions for your discipline?

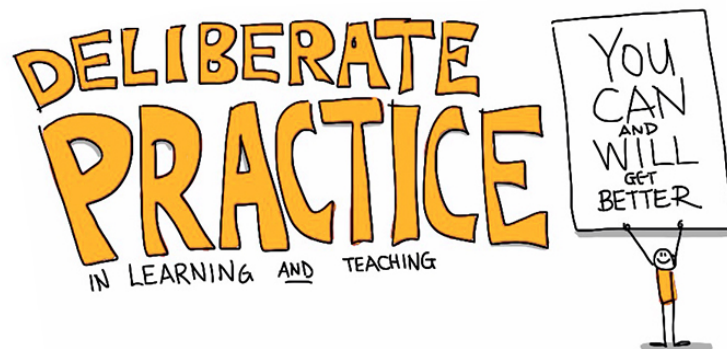
Metacognition

Students need to assess the demands of the task, evaluate their own knowledge and skills, plan their progress, monitor their progress, and adjust their strategies as needed.

Self-directed learning and actively taking the time to reflect on one’s own learning is described as **metacognition**. Developing metacognitive skills through deliberate practice and embedded checkpoints fosters intellectual habits that are valuable across disciplines.

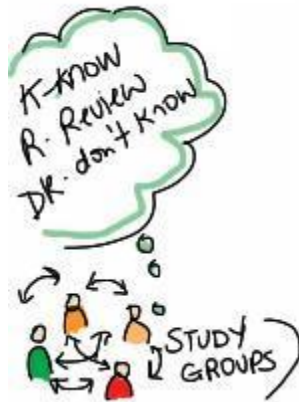
These checkpoints should occur at the beginning of the learning where students are encouraged to practice task assessment and planning. Metacognition should continue through the evaluation of the outcomes and adjust approaches accordingly.

A very important factor for developing this flexible mindset is rooted in students’ self-efficacy. It is extremely useful for instructors to stress the importance of developmental approaches so that they can fully appreciate that intelligence is not fixed.



Strategies to promote metacognition

- Be explicit; indicate what you don't want; provide performance criteria.
- Provide opportunities to peer and self-assess; practice; and give feedback.
- Ask your students whether the answer they provide is reasonable given the problem.



Here are some helpful prompts to ask your learners:

- What do I already know about this topic?
- How does this topic make me feel?
- Does this topic relate to something I already know?

One activity that can be done at the end of class is [Stephen Brook's critical incident questionnaire \(CIQ\)](#).

Other metacognitive strategies that lead to self-directed learners are [Note-taking](#) (see organization), One Minute Paper (see feedback & practice), Reflective Writing (nuggets), Exam Wrappers, Retrospective Post-Assessment.

Extend Activity



This activity is taken from the Thought Vectors <http://thoughtvectors.net/syllabus/>, designed by Dr. Gardner Campbell.



Nuggets: Check out the [Faculty Patchbook](#), and select an article that resonates with you. Take a passage from the article that grabs you in some way and make that passage as meaningful as possible.

It could be a passage that puzzles you, or intrigues you, or resonates strongly with you. It could be a passage you agree with, or one you disagree with. The idea here is that the passage evokes some kind of response in you, one that makes you want to work with the passage to make it just as meaningful as possible. A good length for your nugget is about a paragraph or so. Too much, and it becomes unwieldy. Too little, and you don't have enough to work with.

How do you make something as meaningful as possible? Well, use your imagination. You'll probably start by copying and pasting the nugget. Or if you're feeling very multimedia inclined, read your nugget aloud and make an audio file. From there, consider hyperlinks, illustrations, video clips, animated gifs, screenshots, whatever. Make the experience as rich and interesting as you can.

Obviously, one of the main goals of this assignment is to get you to read carefully and respond imaginatively. Your work with "nuggets" should be both fun and in earnest. It should demonstrate your own deep engagement and stimulate deep engagement for your reader as well.

Culminating Extend Activity

Throughout this module we've explored various types of metaphors for teaching and learning.

Prior learning was **baggage**.

Motivation was **drive**.

Mastery and organization of knowledge are like component **building blocks** toward a cohesive structure.

Self-direction and metacognition are like our own **internal GPS** signaling our own personal wayfinding.

Now it's time to put it together considering your own teaching philosophy. What is your metaphor for teaching and learning?

Here are some [exercises for exploring your teaching philosophy and some metaphors for teaching](#) from the University of Waterloo.

Find a photo or draw a picture. Narrate why this image represents you and your approach as a teacher.



Module Checklist



I have:

- Reflected on all seven principles of How Learning Works
- Identified a concept that is often misunderstood in my discipline and created an analogy to help make sense of it (Prior knowledge)
- Created a concept map of a syllabus for a course I teach (Organization)
- Practiced my note taking skills (Organization)
- Brainstormed a list of “What’s in it for me?” from a student perspective (Motivation)
- Identified a concept in my discipline that is like driving a car and specified the component skills that are required to master this concept of skill (Mastery)
- Created an introductory activity, connected to my discipline, to get to know my learners (Climate)
- Found a nugget and made it as meaningful as possible (Metacognition)

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