Teacher for Learning Module

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 seem disinterested and distracted. 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.

Source: https://unsplash.com/photos/Oalh2MojUuk

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, accessible, intersectional, and equitable. 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.

Extend Connections

Effective: producing a decided, decisive, or desired effect.
Intersectionality: The interconnected nature of social categorizations such as race, class, and gender, regarded as creating overlapping and interdependent systems of discrimination or disadvantage. Coined by Crenshaw (1989), it takes into account people's overlapping identities and experiences in order to understand the complexity of prejudices they face.
Equity: Just and fair inclusion. The goals of equity must be to create conditions that allow all to reach their full potential. Equity is less concerned with the optics of making things look "equal", rather it addresses structural imbalances that keep all from fair experiences.
Accessibility: is a general term used to describe the degree to which a product, device, service, or environment is available to be used by all intended audiences.

Outcome

Design effective learning activities and experiences that are grounded in research-based principles of learning that promote students using their knowledge in meaningful ways.

Objectives

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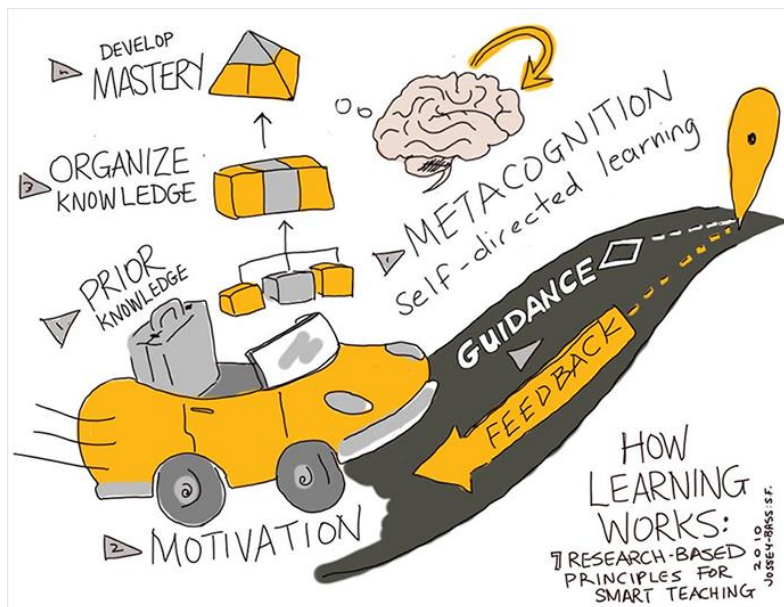
Prior Knowledge

We know that without a doubt that the single most important attribute that your students bring to class is their prior learning and experience. Students will come to learning from a multitude of experiences which will be important to consider in your pedagogy. This knowledge can either contain essential building blocks to advance toward mastery or be a heavy weight that slows down and impedes learning.

Prior knowledge can help or hinder learning

Help: Using students' own experiences to generate examples helps learners to make connections and increase retention and overall knowledge acquisition. 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 specific height would fall slower than an anvil that is dropped from the same height. 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 principles and 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 amongst the students' responses.
- Allow space, without pressure, for students to self-identify during these assessments. What they tell you about where they are coming from will be important for your pedagogy.

Connect new knowledge to prior knowledge

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

Extend Community

Visit the Extend Community Space Misunderstood Concept discussion area (in the #teacher4learning channel) to identify a concept that is often misunderstood in your discipline. Explain why the concept is important and what the impact/effect is of not understanding this concept. Try to explain what might be some factors that can contribute to your students' misunderstanding of that concept—where are they coming from? Knowing the root of the misconception will often help navigate undoing it.

Extend Activity

Next, extend your thinking on this misunderstood concept. Can you think of an analogy that can help make the concept make sense to students? Does this analogy take into account where

students are coming from in their previous experiences? Or how could you break that concept down into bite-size chunks so your students can more easily digest that harder-to-acquire information?

Now, re-state your misunderstood concept and then identify and expand on how you would explain your concept through an analogy by responding to the Misunderstood activity.

As evidence of completion, please plan to enter the web address for your response in the Teacher for Learning badge submission form.

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.

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.

- o Dollar bill

- o Dice

- o Tricycle

- o Four-Leaf Clover

- o Hand

- o Six-Pack

- o Seven-Up

- o Octopus

- o Cat Lives

- o Bowling Pins

- o Football Team

- o Dozen Eggs

- o Unlucky Friday

- o Valentine's Day

- o 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 that 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 to stimulate the recall of previously acquired information. 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 of all intersections of identity.
- 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).
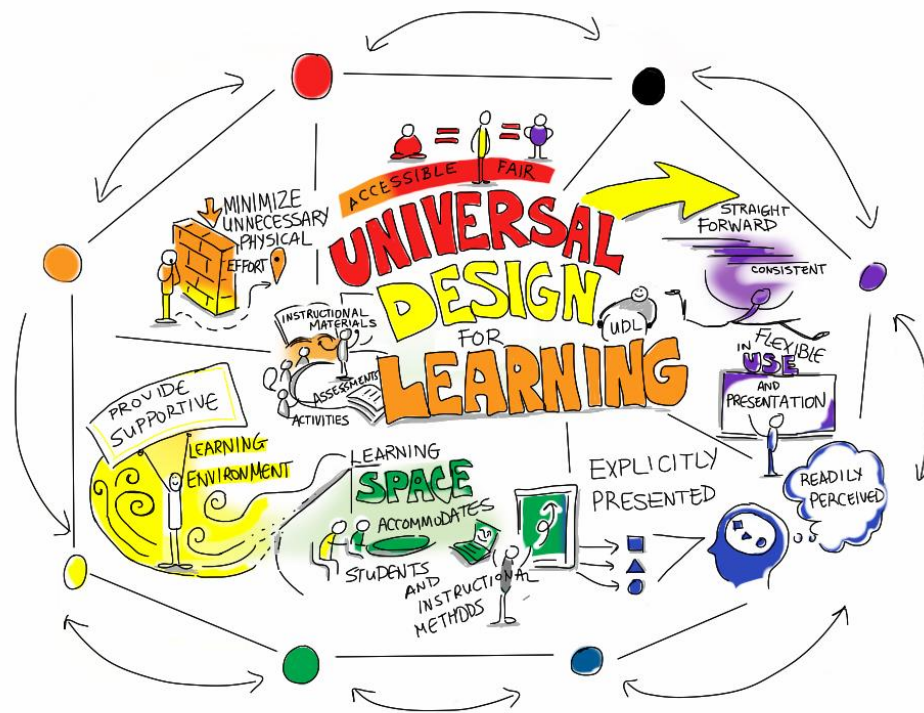
Mind mapping

Mind mapping has been found to be an effective means of helping students organize new learning while reinforcing previous learning and improving information retrieval. Some studies have found that using mind mapping as a learning strategy facilitates memory and critical thinking.

If you are 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 content to include and how they are connected. You could then share it with your 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, according to Biktimirov & Nilson, 2006 in Show Them the Money: Using Mind Mapping in the Introductory Finance Course.

Extend Activity

Using MindMup or another visual organizer tool in the Extend Toolkit, create a concept map of your course syllabus.

Please upload or link your concept map as a response to the Syllabus Concept Map activity.

As evidence of completion, please plan to enter the web address for your response in the Teacher for Learning badge submission form.

Offer a partial graphic organizer

Instead of providing your complete lecture notes on the LMS, consider offering a partial graphic organizer (see Visual Organizer Tools in the Extend Toolkit) that highlights some of the key learning. This creates high impact learning as students are able to actively participate in their learning, especially if you prompt them to record in important facts to create the full picture. This practice should also help to ensure attendance remains high. In Increasing Text Comprehension and Graphic Note Taking Using a Partial Graphic Organizer, Robinson et al (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=WtW9IyE04OQ

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.

[Download a PDF](#) version of these Cornell Notes.

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 widely known that students who take the time to review their notes do much better than students who do not. It is important to note that for many marginalized students, time in the classroom is the only space they have to fully dedicate to understanding concepts. 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. Invariably, they can also discard confidently held misinformation in doing this.

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 related to this "good exam question."
- 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 is time to pack up their laptops and belongings. In contrast, the summarizing time and activities makes the students' thinking visible and provides an immediate opportunity for students to confront any misconceptions.

Extend Community

Do you have any successful tips/techniques/best practices to share with regard to how you typically end your lectures? Or if you do not teach, perhaps successful ways to end a presentation?

Visit the Extend Community Space Lecture/Presentation Endings discussion area (in the #teacher4learning channel) to share your thoughts!

Extend Activity

Watch a TED Talk or conference keynote video to practice your own note taking skills using Cornell Notes.

Please upload or link to your Cornell Notes, include the name and link for the video you watched, and describe your experience note-taking as a response to the Cornell Notes activity.

As evidence of completion, please plan to enter the web address for your response in the Teacher for Learning badge submission form.

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 do not seem to muster or exude the same level of excitement. Sometimes they do not 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? This may mean shifting your understanding of why students are enrolled in your course. They might not be there to learn for learning's sake, but to further their employability trajectory. You should not pander, but it is important to be mindful of the different

motivations for learning and attempt to find creative ways to make learning meaningful for every student.

Extend Activity

Brainstorm a list of WIIFM from a student perspective. If you cannot 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. Sometimes, what excites you, might not be what excites them.

Please upload or link your WIIFM list as a response to the WIIFM activity.

As evidence of completion, please plan to enter the web address for your response in the Teacher for Learning badge submission form.

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 is difficult to break down the concept into its component parts because your thinking has been irrevocably transformed. It is our role as educators to try and remember what it is 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 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? Identify and explain the component skills required to master this concept or skill.

Please share your discipline aligned concept and creative explanation as a response to the [Like Driving a Car activity](#).

As evidence of completion, please plan to enter the web address for your response in the Teacher for Learning badge submission form.
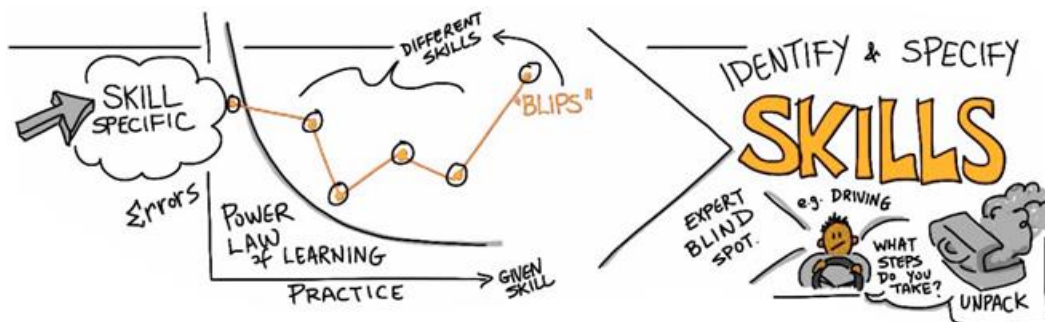
Feedback and Practice

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 performing 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 kernel was for a lab, 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. You cannot expect students to achieve the learning goals if you made the process of getting there both convoluted and unattainable.
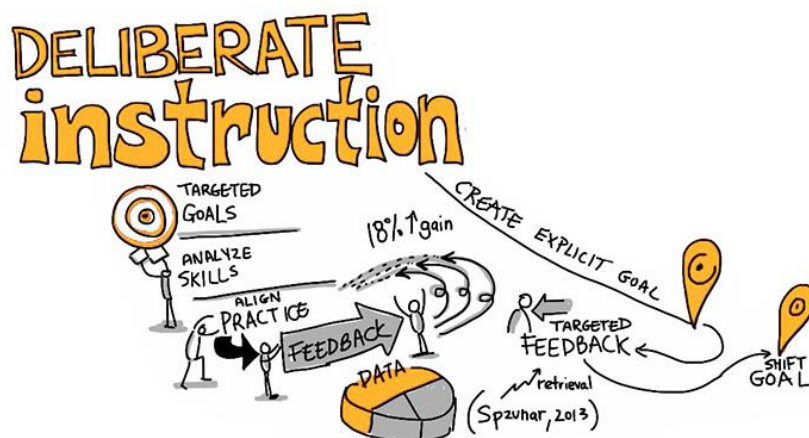
Climate of the Course

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

Providing opportunities for small-group learning and interaction.

- Creating a classroom charter.
- Listening carefully.
- Offering opportunities to be heard
- Consider intersectional experiences
- Providing an environment that makes uncertainty safe.
- Examining your assumptions.
- Being respectful and inclusive: incorporate diverse experiences and contexts.
- Considering cognitive, psychomotor, and affective domains.
- Being an authentic and genuine teacher.
- Co-designing learning goals and classroom expectations.

These factors that promote a healthy classroom climate will vary depending on the people involved. It is 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 the presentation of content, described as the "cognitive presence," it is also important to balance and consider social and teaching presences.

Extend Connections

Be aware that some ideas of a positive classroom space can come at the expense of marginalized students. When trying to create a learning environment that is productive and inclusive for all students, consider the multiplicity of experiences students might be coming from.

Some great resources that might help you think about this are:

Anthony Jack's Ted Talk On Diversity: Access Ain't Inclusion
Peter James Hudson's interview with "Katherine McKittrick, Author of Demonic Grounds, on Trigger Warnings"

Extend Community

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 identify a location from which they would want to conduct field work
- 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?

Visit the Extend Community Space Please Allow Me to Introduce My Field discussion area (in the #teacher4learning channel) to share your discipline related questions!
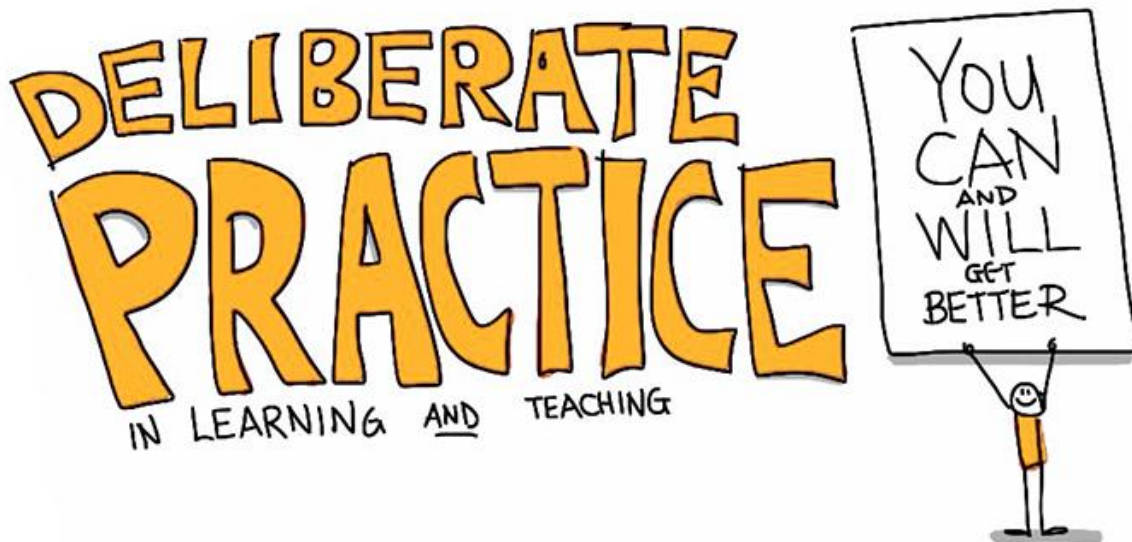
Metacognition

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 for learning retention and 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 do not 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:
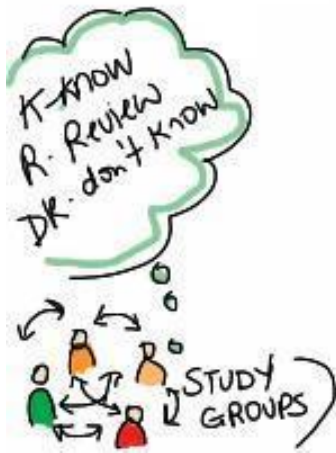
- What do I already know about this topic?
- How does this topic make me feel?
- Does this topic relate to something I already know?
- How can I apply this topic in another context?

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, and Retrospective Post-Assessment.

Extend Activity

This activity is taken from the Thought Vectors in Concept Space syllabus designed by Dr. Gardner Campbell for an undergraduate research and writing course at Virginia Commonwealth University.

Nuggets: Review The Faculty Patchbook, a collection of faculty authored overviews of specific pedagogical skills. Then select one article that resonates with you. Select a passage from the article that grabs you in some way and prepare to 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 as meaningful as possible. A good length for your nugget is about one paragraph or so. Too much, and it becomes unwieldy. Too little, and you do not have enough to work with.

How do you make something as meaningful as possible? Well, use your imagination. You will probably start by copying and pasting the nugget. Or if you are feeling very multimedia inclined, read your nugget aloud and create an audio file. From there, consider hyperlinks, illustrations, video clips, animated gifs, screenshots, infographics or whatever. Refer to the Extend Toolkit to help you with a technical tool selection choice for this activity. 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.

Please share the nugget made meaningful as a response to the Thought Vectors activity.

As evidence of completion, please plan to enter the web address for your response in the Teacher for Learning badge submission form.

Extend Activity

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

Prior learning, not prior experiences and contexts, were potential roadblocks.

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

See some exercises for exploring your teaching philosophy and some metaphors for teaching from the University of Waterloo.

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

Please upload or link your image and explanation as a response to the Your Metaphor activity.

As evidence of completion, please plan to enter the web address for your response in the Teacher for Learning badge submission form.

Module Checklist

I have satisfied the following criteria and will submit evidence in the requested fields when applying for the Teacher for Learning badge. Your profile page in the Activity Bank provides links to all the responses you have submitted.

Criteria and Evidence Required for Badge Assessment – I have:
Identified a concept that is often misunderstood in my discipline and created an analogy to help make sense of it. **Evidence:** Enter the web address for your response to the Misunderstood activity.
Created a concept map of a syllabus for a course I teach. **Evidence:** Enter the web address for your response to the Syllabus Concept Map activity.
Practiced my note taking skills. **Evidence:** Enter the web address for your response to the Cornell Notes activity.
Brainstormed a list of "What's in it for me?" from a student perspective. **Evidence:** Enter the web address for your response to the WIIFM activity.
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. **Evidence**: Enter the web address for your response to the Like Driving a Car activity.
Found a nugget and made it as meaningful as possible. **Evidence**: Enter the web address for your response to the Thought Vectors activity.
Conveyed a metaphor for teaching and learning. **Evidence:** Enter the web address for your response to the Your Metaphor activity.
Reflected on the module experience. **Evidence:** Enter your reflection statement into the space provided on the badge submission page.

Apply now for your Teacher for Learning Badge