Learning Strategies

Important tools and metacognitive skills that make studying easier

Learning and teaching

These are not the two sides of the same coin, but two separate processes. Everyone learns without teaching. Most people learn better when taught. Yet, learning is so individual that we shouldn't assume that what was taught was also learned. Learning is the essence of everyday living experiences [1].

Learning

I like to use the definition of Illeris (2003) which states that learning is a two-step progression containing the processes of external interaction and internal elaboration. People, who find learning to be easy, instinctively use the internal acquisition/elaboration process effectively. However, we should always support students to acquire the learning skills that will serve them throughout their lives.

There are taxonomies about learning; Bloom's being probably the most popular. Considering how that taxonomy moves from remembering to understanding to applying and forward, it is easy to see how the internal learning process can also be described as series of plateaus: it is hard or impossible to understand if we can't remember something, or hard to analyze something we don't quite understand. Therefore, helping students to become more proficient learners makes very much sense.

Learning to learn starts from birth, or probably even before it. Learning is a survival tool: babies must communicate their hunger or discomfort, and from that the communications – as well as skills for communicating – grow more complex towards adulthood. Learning is communicating with the environment and materials, hence the importance of external interaction [2]. The concept for knowing to help oneself to learn is the use of ***metacognitive*** tools or strategies.

Helping students to gain better understanding about their own learning and metacognition is often sorely missing from education. We somehow seem to think that students know how to learn. Discussing ways to support internal acquisition and elaboration improves individual learning, therefor also contributing to better measurements of learning outcomes or goal completion.

Teaching

Epistemology is an important part of teaching practice because it directs the choices instructors and institutions make while planning and executing curriculum and instruction. Our epistemic beliefs about what explicit (formal) knowledge is and how we gain it ranges from transmitted and stored knowledge (general) to situationally constructed knowledge (personal). The view of the mind-as-a-container where knowledge is pieces of information reflects the behaviorist view, where learning can be measured by external behaviors [3]. The view of dynamically developing knowledge structures and conceptions [4] are better aligned with contemporary cognitive research, reflecting higher order learning, which often is described as critical thinking, problem solving and the ability to monitor and regulate one's own learning.

While designing instruction, it is important to separate the learning process from assessment of learning. To put it simply: learning is what **we do** to increase our **own** knowledge, but assessments and

evaluations are external measurements of our learning, either to verify the effects of instruction, or being requested by stakeholders.

For different objectives and assessments we need to choose different learning strategies:

- Short answers and multiple choice tests are popular assessments. While an objective assessment or evaluation (typically an exam) appears to only require memorization, the advanced design of exams actually attempts to measure students' contextual learning (e.g. using language or new concepts in the context of the subject matter). Having several study sessions over the week or weekend works best for studying for exams, because we need to recall information in the beginning of each study session.
- Writing an essay is another typical assessment. It is important to remember that essay-writing is not really a *learning* task, but communicating clearly about the learned content using the vocabulary attached to the task. For writing tasks a longer time period spent with studies will work better, like dedicating several hours over the weekend, to have time for organizing and communicating what you have already learned.

Choosing a suitable learning strategy and planning how to use the time well are important parts of being an effective learner. ***Self-regulated learning cycle*** [5]discusses this more in-depth, but it is good to have awareness of the ***three phases of learning***: Planning (or forethought phase), performance (where we do learning and assessments), and self-reflection (self-judgment and evaluating one's own performance). Without planning we move haphazardly through the learning content and may not realize where we can coast and what parts need more focus and effort – this is very personal, we all have our previous knowledge that comes into play here. Most often we just focus on the performance phase, everyone is familiar with that! But the learning cycle can either hurt or help our future engagement, this is why reflecting on what went well and what we might want to do differently next time is so important.

Learning Strategies

Supporting students' deeper learning by suggesting new or additional learning strategies is an important part of helping students through their educational paths. This has nothing to do with "teaching the content" because most strategies are just techniques for understanding, hence being completely independent from subject matter. For example: Simply knowing several different ways for using a graphic organizer can be used with any given learning task – whether trying to master multiplication, rules of the road, verbs in foreign language, parts of a cooking recipe, names of condition-specific medication, countries of the world, or currently know elementary particles (38 last time when I checked, wow!). The graphic organizer, like a mind map, is simply a visual representation of the learning content, possibly with some connections. It doesn't even have to be hierarchical.

Using ***active learning strategies*** to acquire information and elaborate it is important for deeper learning. Most students are familiar with ***passive learning activities*** that include listening to a lecture, watching a video, or reading a text without engaging in any additional activity (like note-taking, highlighting, or underlining to support personal knowledge construction). In most situations various different learning strategies are compatible with given learning objectives and tasks.

For memorization

Plain memorization techniques help us to remember things, but we should also ***practice retrieving*** what we have memorized, so that we can use that information. The following learning strategies can help in the first part of internal learning process, acquisition, which mostly relates to memorization, but not really learning how to use the information:

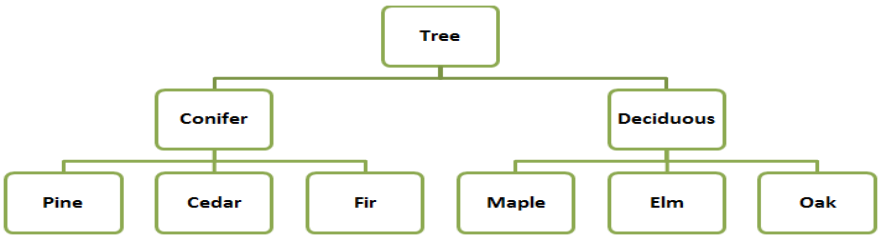
- Use **mnemonics** as a **memorization technique**. Most people are familiar with mnemonics, but they shouldn't be your only learning strategy. Sometimes mnemonics work well as the initial stepping stone – to be able to recall the content to be learned. But learning should always continue from that initial plateau towards being able to apply the content.
- **Creating your own mnemonic** devices can be very effective, because it combines the recalling practice with something that may be personally meaningful.
- **Draw an image** of the items to be memorized – we tend to remember images better than lists of words. Do not copy an image, it has to be your own so that you can attach meaning to it (more about this in the next part: creating connections).
- The important second step is to **practice recalling** things – turn away and try to remember the items. When you have a chunk memorized you can use the time in queue, commute or other delay to recall learned items (e.g. countries, states, capitals, periodic table, historical events, learning theories/theorists, etc.).
    - Maybe have a list of things to recall on your phone?
    - Save your image of things to be memorized on your phone and practice recalling with it
- You can also **quiz yourself**. Using learning checks is sometimes called the quizzing effect but the idea is the same: instead of re-reading things, try to recall or answer questions about your study material.
    - Take a picture of practice test or quiz questions to practice on your phone.
- And, lastly, you can also use **flashcards** to initially memorize things. Often flashcards are not very effective, because they detach the items to be memorized from the context where they belong. If you really want to use flashcards, make your practice more effective:
    - Take a picture of 3 flashcards and save them on your phone
    - View these 3 cards 10-20 times a day – this repetition helps to memorize them
    - Choose 3 other flashcards for the next day.

Please, don't stop learning process yet: remembering is just the first step! The following strategies will support deeper learning.

For creating connections

Information alone has a very short memory life. It needs to be connected to your previous knowledge structure. People have different preferences for associating information (like Piaget's assimilation and accommodation), and everyone has their own personal way of organizing the information for retrieval. There are several ways to support organization and retrieval.

- Learning is always **contextual and situational**, so your study strategies should reflect this fact. What is the context of the content, and can you relate it to other contexts? In what situation is the new information useful? How could you apply it (in your work, life, or learning)?
- Attach new information to **real life experiences** – extend the content to apply to work/life situations you have had. How does the reading relate to what you have experienced in your work or life? In what situation could the newly learned information make a difference?
    - ***Create scenarios and examples*** of using the information to be learned in real life, based on the experiences you have already had (or a virtual experience).
    - While connecting new information into existing knowledge, create a real life scenario and make a ***short note of the scenario*** to revisit the idea on a later study session.
    - Often just few words are enough ***to remind ourselves*** about an idea. Some people prefer to connect things to dates or places. Use what works for you!
- **Chunk details** together. Create visual cues for information, either graphic organizers, or something as simple as your own fingers, may help to organize the content and find a common denominator for details or concepts.
    - After chunking details together, remember to practice recalling.
    - Effective chunking helps recalling
- Take **contextual notes** – use images, mindmaps or doodling, and also write down your ***thoughts or ideas*** the reading evoked. This helps you to transfer your learning into other settings.
- Mindmapping is an effective way to understand connections within the material, and also create a visual representation of the content (small chunks at the time, though!) Mindmapping doesn't require any advanced tools, just pen and paper, and maybe different colors. It's almost like doodling with a purpose. There are also virtual tools for building a mindmap. The VERY important thing to emphasize about mindmapping is that there is ***not one correct way*** of doing it. It gets to (and has to) look like one's own individual thinking.
- Build **concept hierarchies**, think of umbrella terms, and **categorize information** in a way that is meaningful to you – then check your study materials to make sure you interpreted them correctly. An example of hierarchy could be the taxonomy of plants. Think about trees:



- **Color-coding** the content can be extremely helpful, because the color can give an immediate cue about the higher order concept.
- Ask **why and how questions** about the material you are learning to expand your understanding and situate new information to what you know already. While reading or watching a video, have a visual reminder to ask yourself questions like: "Why is …?" "How far...", "How much…", and "What if…" about the topic to test the limits of the concept, or uses of the information.

For pacing your learning

Learning takes time, because we need to situate new information into the context, and that's why it is important to **span studying over time**. Unlike computer memory, humans need to revisit things they know, simply because human knowledge is very contextual [6]. Studying in smaller chunks during the week is more effective than 7 hours on weekend. There is more than 100 years of research showing this [7], so we should believe it is the ***best*** practice. There are lots of ways to plan your studies to have a pace that works for you. Here are some ideas:

- **Rehearsing** what we know is important. This doesn't mean that you must take same quizzes over and over to keep your knowledge, but it DOES mean that you need to use it, or connect it into other things in your life, and be able to talk or write about it.
- **Add variety** – use different strategies and exercises to learn the content. Learning becomes easier when you have several different interactions with the material, instead just the same one, repeatedly.
- **Change the order** – this is a technique called interleaving, which means studying content out of order. This makes studying harder, but often supports deeper learning.
    - Reshuffling your content so that is out of order might be helpful.
    - Interleaving in language pronunciations may not be effective, suggests the article in the link. However, my own thought is that the effect may depend on one's cognitive style (top-down vs. bottom-up, preference for concept hierarchies or details), and other ways we organize information to be learned.
- Plan to **work on your studies** even a little **every day**, or for even better effect, several times a day! Then *save the most important or hardest information to be learned on your cell*, so that you can easily reread it several times a day.

For deep learning

Learning strategies don't have to be polarized! Research suggested that Retrieval Practice Produces More Learning than Elaborative Studying with Concept Mapping [7]. While that may be true, why not combine both, and learn even better? Concept-mapping or mind mapping can effectively support recalling chunks or details. Color-coding concepts can help recalling the categories. Explaining concepts to a friend can help recalling.

Most of the following learning strategies ***combine elements*** from several approaches, just because deeper learning requires engaging in all parts of the learning process: interaction, acquisition and elaboration. This also means taking greater ownership of learning, and also "owning" the content, so that it becomes a permanent part of our knowledge structure.

While teaching we use ***expansive framing*** to help students to make connections to the world they know and also their personal lives and experiences. While studying we need to make these connections without help. ***This is a process that can be learned!*** Please try the following strategies:

- Take time to **reflect on learning** experiences. This is the first tool to be used when aiming for deeper learning. Without having greater ownership over one's own learning, it is impossible to

start steering our learning approaches. Therefore, reflecting our past successes as learners and building an accurate academic self-image is the foundation for deeper learning. Then we can have better understanding of what we need to learn, and how we could do it. (Remember, this is also an important part of the self-regulated learning process)[6].

- Find ways to do **cooperative learning.** Talking with others learning the same content and engaging in ***joined reflection*** helps us to tap into the understanding of our fellow students. We all have a unique way to elaborate what we learn, and sharing our thoughts with another student enriches both participants, and the whole group. So, finding someone to study with or to compare notes, or just talk about the subject/topic is helpful.
- Start using **self-explaining** strategies. This is very effective for deeper learning, because it requires us to be aware of our own learning (self-monitoring our learning), AND then ask questions about our own learning process. For example:
    - What is the next step?
    - What is the big picture here?
    - What do I need to know in order to learn this?
    - What would be another example of this?
    - How could I use this in my classroom/training/work?
    - Does this sound right? (while writing or mindmapping)
    - Do I need to be clearer on this? (while writing, or studying)
- There is much empirical support about the ***beneficial mechanisms of self-explanations*** as how it allows "learners to identify and fill in knowledge gaps" and how using self-explanation as learning strategy helps "learners in the construction and repairing of their mental models" (Fonseca & Chi, 2011, p. 299) [7]
- Another deep learning strategy is to **explain our new knowledge** to another person. This makes us to ***use*** the vocabulary associated to it. Multilingual people know this effect: *use it or lose it*. We can operate on the level of ***receptive fluency*** and understand much of what we read or hear. However, even a language well learned becomes hard to use if we have no opportunities to speak it, because there is an advanced level of competency required for ***expressive fluency*** and actually forming coherent sentences with the language/about the topic to be learned.
    - This is also called the teaching back strategy, where the student presents their newly gained knowledge to their instructor.
    - Explaining the harder concepts to friends is a great variation. Talking about deep content matter to an "outsider" makes us think about it in a different way, because we have to be very clear without using jargon related to the topic.

Conclusions

Being a successful learner is very important today. There will always be learning opportunities and requirements in our lives, and knowing how to approach different learning tasks makes it easier.

Please remember that we all have personal preferences for using different learning strategies, which is okay. However, sometimes when you need to learn something completely new, it is very much worth your time to try a new strategy.

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