Academic Learning Framework

The process to effectively and efficiently learn academic skills/subjects.

Effectively ⇒ Understanding, experiencing/improving, and retaining

Efficiently ⇒ Less time and less energy (accumulative)

"The better we can learn something initially, the better starting point we have for iteration and improvement"

Outline

Introduction

To start with this model, we need a clearly defined skill/subject to learn. The skill should be manageable and if not, we will need to break it down into smaller skills/subjects.

- Example ⇒ "Chemistry", which could consist of
  - Organic molecules
  - Inorganic molecules
  - Atomic structure

- Chemical bonding, etc… (these are very broad)
- We can extract these while learning about "Chemistry", and add them to our bank of learnings we need to take action on as we actively learn. But its easier to extract these skills/subjects first.

💡 IMPORTANT: Before we "learn" this learning framework, I ask for your engagement when there are questions. These questions are designed to help us understand. Spending 20 minutes of quality effort right now is better than spending 10 minutes of poor effort and having to re read and go through this model multiple times in the future.

- 20 minutes of effective learning

  - or

- 10 minutes of poor learning and hours of coming back to this in the future

The framework

💡 **Let's take a moment to gather our assumptions towards learning**

What is your idea of learning ❓

What previous experiences have you had with learning ❓

What is your definition of learning ❓

⬇️ Now let's take a look at some definitions of learning ⬇️

Our definition of learning 📝

Learning: "The improvement of behaviors towards the behaviors required for a desired goal."

> 💡 Where do you learn in your life ❓ Where are you changing your behaviors to achieve a desired goal ❓

Neuroscience behind learning 🧠

The forming, connection, and reorganization of neurons within the brain.

So let's learn then! What do we need to do?

1. Identify our goal

2. Identify the behaviors/skills/subjects required

3. Learn the behaviors (**what we're doing now**)

4. Form, connect, and reorganize neurons within the brain (**what we're doing now**)

We are going to focusing on learning skills and conceptual ideas rather than the specific behaviors. The point of this is that we will then have the skills forever. In which the skills produce the behaviors. Where if we only learned the behaviors, we might not be able to produce the behaviors again with different conditions.

- Once we learn how to make people laugh, we can make anyone laugh at anytime :)

- If we only learn how to make Tom laugh, we may only be able to make Tom laugh...

Understanding the framework

> 💡 If you were to learn a new skill/subject, how would you plan your learning ❓
>
> Would you plan/strategize ❓ Would you use trial and error ❓ Do some research, practice problems, read books ❓

1. **The first step we have is to convey our own understanding of a skill/subject. This is to make the new information more valuable/impactful.**

   a. We can simply write down what we think about the subject and what our previous experiences with it have been

2. **Getting expert information, asking quality questions using our own curiosity, and creating first principal truths**

   a. *Why?*

      i. Engaging in deep, meaningful, and critical thinking allows us to form and reorganize more neuron connections within our brains. Understanding is also critical for improvement later on. ☑️ Our goal is to establish connections within our own brains from insightful information and critical/independent thinking.

   b. *What is expert information?*

i. Well supported and well used information. Information from experts in the field who spend a lot of energy into learning these skills/subjects. From people who have been in the game and have experience with the skill/subject. ✅

c. *How do we get these expert understandings?*

   i. This is one of the more time consuming things in the model, but it will be through research and sifting through experts. We can simplify it to who is most well respected and why? If for good reasons, it is most likely beneficial to use their information. ✅

d. *How do we ask first principle questions?*

   i. We ask questions directed to create or identify fundamental truths.

      1. Why? How? What for? ⇒ are common approaches

      🛠️ Example) Topic is "Neural Networks"

         1. Some expert understandings: There are node layers (contain an input layer and output layer), hidden layers, weights, and thresholds.

         2. Questions

            a. Does a node layer contain the input and output layers?

            b. What does the input layer do? What is it?

            c. What does the output layer do? What is that?

            d. Where are the weights and thresholds? What is their purpose?

         3. Like a little kid that does not know what is going and is trying their best to understand each independent component and connect them together (incrementally).

         4. Creating our own independent thoughts based on truth (our own connections)

3. **Working with different examples to find discrepancies and create more understandings**

    a. Better examples ✅

        i. What makes this implementation better?

    b. Worse examples ❌

        i. What makes this implementation worse?

    c. Creating our own examples ✅

        i. Conveying our understandings.

4. **Now let's make some errors and test our own understanding! (Feynman technique)**

    a. We are going to explain the subject/skill and the understandings in our own words, keeping it simple. 🗣️

    b. The purpose is to identify areas where we lack depth

        i. *Why? When we make errors within learning, we produce neurochemicals that increase plasticity in the brain, which helps us learn more.*

            1. *When doing this, we can also identify weak areas for improvement (aka: areas we need better understandings)*

5. **Ok, now let's use the understandings we have built and take action (implementation)**

    a. When implementing, it seems better to focus on the approach (conceptual ideas) than the finer details at first.

        i. *It seems to help the current and future implementation by creating an organized and well grasped bigger picture, setting direction and purpose. When we have a well established foundation, we can adapt and be flexible to new information in the future. Moreover we can isolate independent areas and solve core problems early on, saving time and energy.*

    b. We can implement through any situations/examples/problems that utilize the understandings we have created

        i. *Preferably building our implementation skills incrementally starting with simple problems and then building up to more complex ones.*

6. **One of the more important parts to this model during and after our initial implementation is focusing on improvement**

    a. We need to implement again, but focusing on a couple of things

        i. Notice our errors, collect feedback, and create an idea of how we can improve the implementation 📈

        ii. It's important to focus on areas of weakness and areas of errors!!

    b. Repetition and learning each time 🔁

        i. Not aiming to get it right the 1st time, but by the 3rd, 4th, 5th time, significantly improving. We are aiming for excellence many times after by continually improving each iteration.

🚫 Struggling to improve and a potential reason why

1. Struggle is good sometimes, but when it is taking a lot of energy to improve, it is most likely because of our poor understandings. To reason forward and improve, we need in depth understandings.

   a. For instance, we're learning a new language and every time we talk to someone native to the language, they don't understand what we're saying. We continue to change up the words, tone, slang, and more, but they still don't understand. We continue to struggle through many adjustments and attempts of improvement.

      i. We were unable to recognize how or what to improve because of our poor understandings. If we understood (part of understandings) that sentence structure, grammar, and punctuation are key parts of language and they were the leading factor to the miscommunication, we would have been able to quickly improve our sentence structure, grammar, and punctuation to fluently speak with them.

         1. To remedy this, we can focus on 2 things.

            a. We can create, modify, and add new understandings related to sentence structure, grammar, and punctuation to then improve.

            b. In the future, we can try and deepen our understandings initially, so we come upon this increased struggle less often.

7. **Let's retain these learnings**

a. *How do we retain something?*

    i. Intrinsic rewards 😀

        1. *Why? Because intrinsic rewards fuel behavior regardless of condition, circumstance, external environment. This is motivation.*

        2. Three main intrinsic rewards ⬇️

           a. Autonomy 🚗

               i. What we are doing allows us to have more freedom and control within our lives.

           b. Mastery 👨

               i. We are the product and with continual learning, we are building the product (ourselves!). We can continue to build ourselves to be better and better!

                  1. We can also gamify things and create levels and activities to increase our character and etc...

           c. Purpose ☀️

               i. What we are doing means something. It has meaning to us, to others around us, and to future generations.

🛠️ Examples of rewards

> 1. (Autonomy) Setting time aside for something that brings us joy not related to work. It can be creative, something that makes us happy, something that we've always loved, etc...
>
> 2. (Autonomy) Spending times with friends or in social settings that have a positive impact on us.
>
> 3. (Mastery) A frame of mind we have for when we put effort towards learning, after each learning session, associating the work we have just completed to improving who we are and the skills we have. Gamifying things.
>
> 4. (Purpose) A frame of mind or even seeing the direct effect our work has on people. That what we do does mean something and it is not to be disregarded.

ii. Associations (unconventional) 👥

Goal is to link new information to already existing neural connections. Utilizing existing connections to aid new connections.

1. Linking new aspects of learnings to core values

2. Linking new learnings to habitual behaviors (need to identify habitual behaviors)

   a. *This initially builds the current connection with the association, but over time, it independently emerges. It becomes unconscious knowledge.*

🛠️ Example) Learning environmental subjects

1. (Learnings to core values) "Learning about how plants grow is incredibly important to me as I want to reduce the carbon footprint on earth (environmental sustainability)."

2. (Learnings to habitual behaviors) "Learning about environmental subjects is just like taking out my recycle each day. It is a helpful and repetitive thing."

Example) Learning mathematical concepts like y=mx + b

1. "I value problem solving and the equation y=mx + b is a key equation to problem solving in mathematics" (Learnings to core values)

2. "The equation y=mx + b relates to my everyday morning jog, the rate at which I run can be represented as the equation y=mx + b." (Learnings to habitual behaviors)

8. **Now we must expand our brain a little bit (expanding perception)**

   a. *Why? So we can use our nuance and subjective perception to come up with creative solutions. For discovery, invention, and innovation.*

   b. Currently two ways

      i. Say the original skill we learned is "how to build a traditional 2 story house"

      ii. Increasing complexity

🛠️ If I had to create an A frame house on the corner of a cliff that is made out of brick, stone, and wood, how would I approach and do this?

iii. Increasing scale

🛠️ If I had to create 100,000 of these houses, how would I approach this?

iv. Both scale and complexity

🛠️ If I had to create 100,000 A frame houses on the corner of cliffs made out of brick, stone, and wood, how would I approach this?

Example with the framework

🛠️ Example: Learning a simple psychology concept called the "Zeigarnik effect"

This implementation of the framework is the focus here, not necessarily the topic

1. Conveying my own understandings 🧠

    a. Well, I currently know nothing about the Zeigarnik effect. I read a brief description that it is when we tend to remember unfinished things better than finished things such as work, projects, tasks, etc... I'm not sure why though.

2. Getting expert understandings and asking first principle questions 🧠

    a. Expert understandings summarized

        i. We tend to remember unfinished tasks way better than finished tasks

        ii. Once we start a task, psychological tension is produced and will only be relieved when we define the task as "finished" or "complete"

        iii. Bluma Zeigarnik identified this phenomenon with waiters/waitress' taking orders in restaurants

        iv. The cognitive tension doesn't only aid memory, but may motivate individuals to complete what they've started

        v. Personal interest can affect the tension with unfinished tasks (high or low)

    b. Questions during and after ❓

        i. Why does not finishing a task cause discomfort?

            1. Evolutionary answer: It is an evolutionary response we have developed, especially with survival instincts that it is best to find closure within something before moving on

            2. Cognitive answer: Our brains are predictive machines and when there are gaps or absences, we struggle with

prediction and order. Leading us to prioritize the gaps or absences of information (uncertainty).

    ii. What about pairing discomfort with relevant information causes us to remember?

        1. Answers: We prioritize the information due to evolutionary or cognitive reasons. Seeking comfort and closure instead of discomfort and uncertainty.

    iii. If we finished the tasks, but still had tension, could this effect be produced?

        1. Answer: With this specific phenomenon, if we were not content with the end result or completeness

    iv. Why do we strive for completed tasks (closure)?

        1. Answer: Achievement, cognitive tension relief, and positive emotional states

3. Using the Feynman technique 🗣️

    a. The Zeigarnik effect is where the discomfort from an uncompleted task that we find important/relevant aids the memory of the information included in the task and furthermore the motivation to complete the task in the future. This is because evolutionary and cognitively, we strive for comfort and certainty instead of discomfort and uncertainty. Also when we are in discomfort and uncertainty, more of our mental resources and energy are dedicated towards solving that problem.

4. Examples (✅Accurate and ❌Less accurate)

    a. A student studies in short intervals and then at the end of each interval intentionally leaves a question unanswered or incomplete ✅

        i. They used short intervals of unfinished work to consistently keep themself motivated and intrigued

    b. A person believes that starting multiple different things will lead to them feeling more motivated. So they decide to learn 15

different new subjects that have no relation to each other. They are left feeling overwhelmed and scattered ❌

  i. They decided to start things they normally wouldn't have instead of leaving their normal activities unfinished. They changed a lot of their actions instead of just adding it as a tool onto what they are currently doing.

c. My own example: Every time an athlete trains for their respected sport, at the end of the training, they focus on one new thing to learn, but are only introduced to it. Then at the beginning of the next training session, they dive deeper into it.

5. Implementation 🔁

a. I used this effect for a couple of days with actions I wanted to complete during the day. At the end of each day, I would list out the actions for the next day and go into them a little bit.

b. Errors: too many topics, not intriguing enough

c. Improvement: sticking to 1-3 of the most important actions for me to focus on and asking an intriguing question for each of them

6. Retainment 😀

a. The reward of closure and ability to remember more information was enough to reward me. However, I also found this as a fun game to recall the information that I was working with previously.

7. Expanding perception 💡

a. Complexity: How could I create the most amount of motivation and intrigue from using this effect? How could I optimize this effect? What would I need to do?

b. Scale: How could I use this effect in different situations where information is involved such as conversations, school, readings, videos, etc?

c. Both: How could I optimize this phenomenon and use it in numerous situations where information is present?

Important considerations

- The most important parts are understanding, implementation (improvement: error, feedback, and new actions), and retainment.

- If we use this model, and are able to add, modify, delete components to optimize our learning, then that is great

- We must learn more about this model and how it best suits us by using it and improving with it

- Finding expert understandings is a key part for helping us identify what behaviors we need to learn

  - It is helpful to use as many outside resources as possible to just sift through as much information as possible to get context to be able to tell what understandings are more helpful

- We want to learn effectively initially, so we don't have to keep going back to learn the basics again (paying forward)

- Mental and physical state are important when learning, there will be a pre learning framework set up for this in the future. Along with a framework designed for identifying goals and the behaviors/skills needed for them.

- Finding what to do instead of what not to do

  - There are many behaviors not to do, but only a few behaviors to do. We want to focus on what we need to do.

- We can use analogies to connect to previous understandings and experiences

  - We just don't want the analogies to limit the functionality of the thing we're learning

- It is important to focus on the concepts before the finer details, so we can solve core problems early on. The concepts can become limiting factors if we

don't understand them initially.

Barebones learning framework

1. Conveying our own initial understandings

2. Understanding

    a. First principle questions

        i. Why, how, what?

    b. Creating sense from expert understandings

3. Feynman technique

    a. Explaining understandings simply in own words

    b. Finding areas of poor understanding

4. Examples

    a. Finding discrepancies between the more accurate and less accurate examples

        i. Why is this example better? Why is this example worse?

5. Implementation

    a. Errors, feedback, and improvement

    b. Improving areas of weakness (limiting factors)

    c. Repetition

    d. "Not aiming to get it right on the first time, but by the 3rd, 4th, 5th time, significantly improving"

6. Retaining

    a. Rewards

        i. Autonomy

        ii. Mastery

        iii. Purpose

    b. Associations

        i. New behaviors to core values

        ii. New behaviors to current habits

7. Expanding perception

    a. Increasing complexity

    b. Increasing scale

Now take action!

- If you think any of the methods used in this learning framework could make your learning experiences easier, use them in your own life!

  - Then let us know how it goes by submitting feedback through our webpage. Our goal is to provide a product anyone can use to learn more effectively and efficiently.

- Have an idea? Submit it to our page too!

- Disagree? Submit to our page!

- Like it? Share with your friends, so they can make their lives easier and experience the benefits too!

- Happy learning 😀 Until next time...