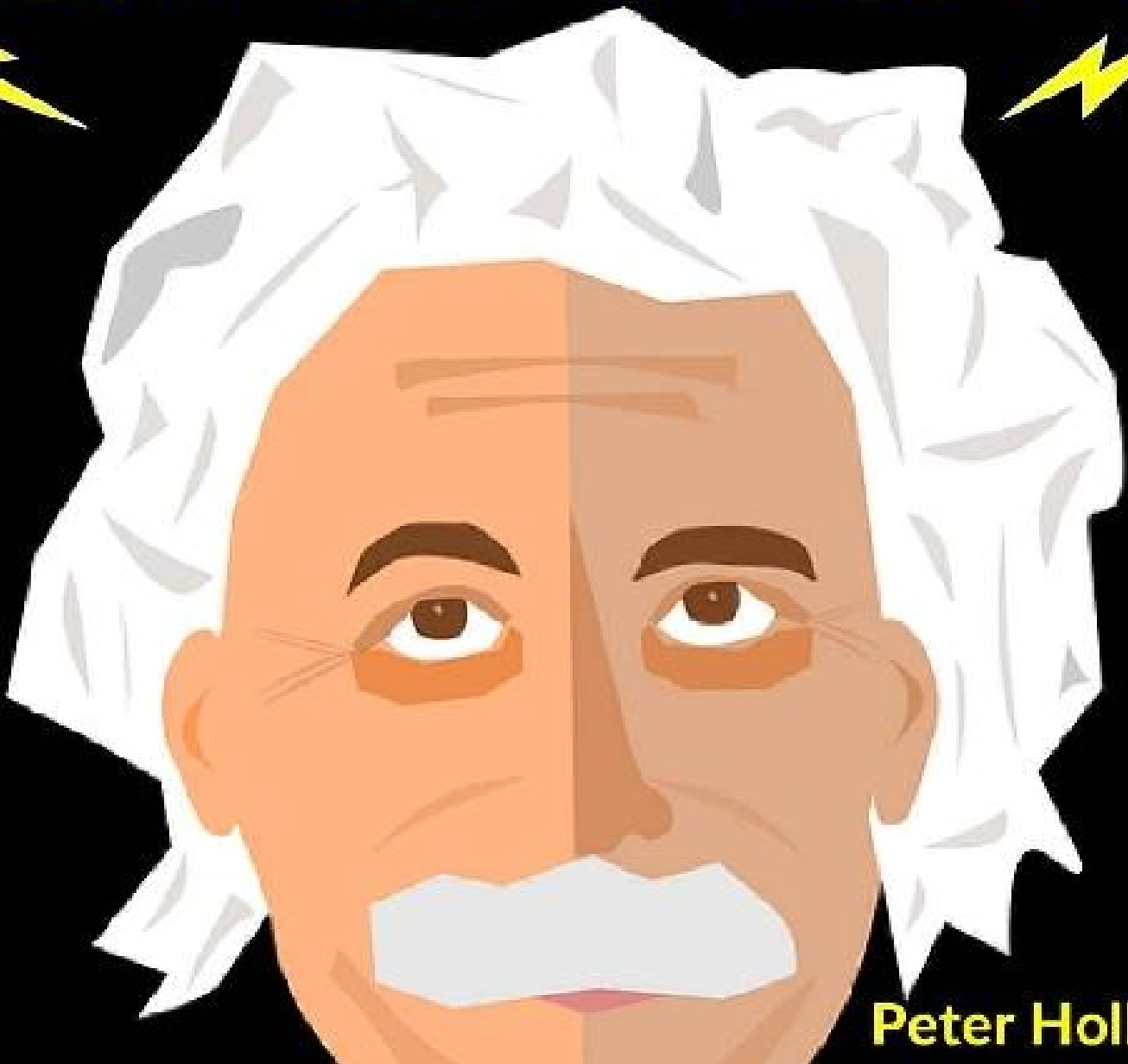
HOW TO MEMORIZE MORE, READ FASTER, FOCUS BETTER, AND MASTER ANYTHING WITH EASE... BECOME AN EXPERT IN RECORD TIME

Learn Like EINSTEIN



Peter Hollins

Learn Like Einstein:

Memorize More, Read Faster, Focus Better, and Master Anything With Ease… Become An Expert in Record Time (Accelerated Learning)

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Introduction

When I was younger, I was never at the top of my class.

I didn't know how to study or learn. I would rush at the last minute to cram and pull all-nighters on projects that I had months for. I would take terrible notes and rely on my friends to help me out. I even skipped class somewhat frequently.

Okay, I was a downright bad student. I just didn't care, and would rather have spent time riding my bike.

However, something happened in eighth grade that would change my world forever.

I wanted to impress *Jessica from Spanish class*. It's a noble and mighty motivation that has been the impetus for many changes in the life of a young (and old) male. We were in the same Spanish class and I had the good fortune of sitting directly behind her. It turns out she wasn't too interested in Spanish either, so she would constantly turn around and ask me for help.

I would first get caught in her eyes, but then my spirits would fall because I realized I had no idea how to answer her questions. What if she started asking the other guys in the class? I didn't want that!

With that in mind, I began to study and learn Spanish so she would have all the more reason to continue turning around and talking to me. It's amazing what you can do when you have the proper motivation for it, and I probably became fluent more quickly than anyone in the class that year. What's more, I would look up obscure or complex phrases and words to impress her, just in case I had the opportunity.

I mainly used a massive set of flashcards. They started with one word on the back of each card, but by the end of the school year, they had three to four sentences on back of each, all in Spanish. I got an A+ in the class, one of my few in my academic career, but I never did get anywhere with Jessica.

Still, I had discovered that when you have an overarching goal or purpose in mind, you can accomplish far more than you would expect. It worked for me.

Most of the time in life, we don't have this type of motivation that drives us to achievement. Most of the things we learn or study for, we drag our feet towards. It's not a pleasure, and it's more of a chore. Studying and learning isn't typically fun.

What do we do then? What do we do when it feels like a struggle to crack open that book or listen to that lecture?

Learn Like Einstein is designed just for you. This book is a collection of learning techniques that are guaranteed to make you retain more and learn faster, even if you hate what you're looking at. You still may not be happy that you're learning or studying at all, but at least you'll accomplish more in less time, and be able to move on to other activities sooner rather than later.

Learning to learn is one of the most valuable skills you can equip yourself with, because anything worthwhile in life is a result of effective and efficient learning techniques.

Chapter 1. Shattering Myths

Welcome to ***Learn Like Einstein***, where the good become great, the great become legendary, and the mediocre become less mediocre!

That may have sounded like hyperbole, but I assure you it's not. Learning how to learn is one of the biggest superpowers anyone can have under their belt. You might not realize it, but learning to learn will unlock just about everything you do in life.

Why? The simple reason that we aren't born as experts – in anything!

When you entered the world as a baby, you didn't know anything on your own, so you first depended on social learning to pick up how to eat, drink, walk, and talk. Everything that we take for granted is something that we learned from others.

The first five years of life are a wash because everyone learns out of necessity. Everyone learns to walk, talk, swallow, and tie their shoelaces. But what about after? You start to see people separate themselves from the pack. Josh can do the multiplication and division tables faster than his teacher, so he gets to skip a grade. Josiah, however, is still having trouble with subtraction so he is held back a grade.

Is it because Josh is inherently smarter? Not necessarily. In fact, that's something we'll address in this chapter and throughout the book.

It's all due to learning, and how each child learns to learn. Then, as we grow older, we start to see people become outliers and separate themselves even more as a result of their talent in learning, not necessarily talent in the underlying subject.

Being that this chapter is about learning myths, that's a good place to start.

Myth #1: Innate intelligence matters in learning.

This took some careful phrasing, because there are indeed some outlier geniuses such as Einstein and Newton that simply think on a different level. However, they are so rare that if you took a minute, you probably wouldn't be able to come up with more than a handful of famous "geniuses." What about the rest of us?

Intelligence is a very, very hazy term. For example, IQ tests claim to measure intelligence (it's right in the name, after all), but they only measure a small set of very specific metrics that they think translates into intelligence. Classic IQ tests measure things like ingenuity, thinking outside the box, seeing patterns, and making connections.

These are good qualities, but as you can see, not quite what would qualify someone to be categorized as intelligent. They don't take into consideration a whole world of factors.

For the purposes of learning, no one is more intelligent or better than anyone else. Learning is something we've all done since we were children, and it's really a matter of work, attention, and some of the principles in this book that take your learning ability to the next level, not your innate talent or intelligence.

Your overall intelligence and learning ability is truly measured by far more factors that can ever be seen in any test results. You can learn just as well as anyone else, and if someone else appears to understand something more quickly, they are simply seeing it through a different perspective, not dissecting it like a genius.

If you don't believe that you are can do something as well as someone else, then why try at all? It's actually a very dangerous assumption that others are simply innately better at something, because it will cause a very real sense of discouragement and pointlessness.

Myth #2: Failure is bad.

Actually, studies have proven that failure is one of the best things that can

happen during the learning period.

Allowing someone to fail, even when you can easily help them, is great for learning as well. This concept is called “Productive Failure” that a researcher from the University of Singapore coined. There were two groups of students, and teachers helped the first group find answers to their set of problems. Meanwhile, the second group was given no help, but was instructed to collaborate and work with each other.

The second group didn’t actually answer any of the problems correctly, but as a result of working together to come up with different approaches, they had a far greater understanding of what solutions could and should look like, and what was involved in generating it. When the groups were compared in terms of what they had learned, the second group “significantly outperformed” the first.

What does this tell us about learning?

Simply giving someone the answer and making sure they never fail is massively detrimental to their learning. It robs us of the critical thinking and analysis that we need to learn better. The struggle for answers is what truly aids our sense of learning.

The Singaporean study also identified three specific conditions that promoted productive failure. First, failure is best when it promotes a sense of challenge and engagement versus frustration. Frustration, of course, is the feeling that you are going nowhere at top speed, so there has to be a sense of progress and achievement. You can’t just hand a child a calculus equation and expect productive failure. It has to be within their capabilities and they have to be able to see improvement.

Second, failure is best when learners have the opportunity to elaborate on what they are doing and thinking, as was done in a group setting during the study. When you can narrate what you’re doing, instead of toiling away in silence, it can help shed light on your efforts because you’re actively thinking about what you’re doing and analyzing it. Often, thinking out loud leads to solutions that wouldn’t have appeared otherwise.

Third, failure is best when learners have the chance to compare solutions that work, and solutions that don’t. This is what happens when you aren’t shown the

exact path every single time. You recognize the red flags of failure and gain intuition when something seems right or wrong.

You could call this a “tough love” approach to learning. Give a man a fish, feed him for a day, but teach a man to fish (while letting him struggle with it himself for a bit), feed him for a lifetime. Allowing failure is when you teach the skill of problem solving, which is another way to define learning at large.

Myth #3: If you forget, you lose.

We have a conception of memory and learning that if we forget something, even momentarily, it’s a sign that we didn’t do a good job learning it in the first place.

That’s not true. In fact, forgetting is an essential part of the process of creating new memories. It’s a filter for unimportant information: we forget what we don’t use or need. Everything we hear or see is headed towards the road of forgetting until we realize that we need or want the information – then we access it from our memory banks.

What makes us realize that we want or need the information? We rehearse or access it repeatedly. It’s this accessing, sometimes called active learning, that actually cements the information into our memory. When the brain has to work hard to retrieve something that may be half-forgotten already, the strength of that memory is correspondingly increased.

Myth #4: More is better.

You’ve no doubt seen this in action with people who study all day and night, and cram the night before the exam as well. Is the greater amount of hours spent studying a better method of retaining information? Not always.

It’s just too much, and while it may not necessarily be detrimental to your learning and memory, it sure isn’t helping. Studies have shown that a concept known as spaced repetition is far more effective for learning and memory than daily rote memorization.

This means the brain is like a muscle, and it simply needs time to recover and make neural connections for the information that you’ve consumed. It also means that if you overdo it and burn out, you are wasting time by attempting to

learn more than your brain can handle at the time. Then, you encounter the phenomenon where you are reading the same paragraph over and over and don't comprehend it.

Finally, it places an emphasis on memorization versus understanding and analysis, the latter of which is what will help information stick in your brain the best. More isn't better; smarter is better.

Myth #5: "I'm just a left-brain person!"

There is a myth that since the brain hemispheres do have certain proclivities towards creativity versus logic, that people should target their learning to cater to these differences.

For example, right-brain people are supposed to be more creative, free-flowing, and carefree, while left-brain people are supposed to be more logical, analytical, and deliberate. It can certainly be a romantic myth to buy into, but it doesn't mean you learn with just one side and that side should be appealed to exclusively.

Both brain hemispheres are involved in almost every single mental process, and studies have demonstrated that people do not have dominant hemispheres whatsoever. What does this mean for you? Just because you're more artistic or more analytical doesn't mean that you should ignore the other parts of life! You can be equally as good at those parts, if not better, so don't let the myth of the dominant hemisphere prevent you from exploring other areas.

Imagine the problems that occur when you focus too deeply on one hemisphere's proclivities: you may be cutting yourself severely short, and you may not diagnose yourself correctly.

Now that we've gotten a few myths out of the way and hopefully feel a bit more empowered and encouraged as to our learning abilities, it's time to dive in and learn the foundations of learning better.

Chapter 2. Foundations for Better Learning

The foundations for better learning are what put your mindset into a space where you are ready to receive and process as much information as possible.

The important word here is “mindset”, as it starts with a concept called “growth mindset”. Researcher Carol Dweck has done multitudes of research on the topic, and she found that most people have either a *growth* or *fixed* mindset.

People with fixed mindsets believe that intelligence and learning ability is innate and determined by genetics. People with growth mindsets believe that intelligence and learning ability is a result of effort and hard work, despite genetic fate. This is an extension of the myth we discussed in the first chapter, the notion that you have a genetic cap to your abilities.

In subsequent studies, Dweck found that people with fixed mindsets tended to learn far worse, because they believed that if they weren’t instantly proficient at something, they were genetically destined to be bad at it. Success was a sign of where they should focus their efforts, and failure was a sign of something to be avoided, as they didn’t feel that they could improve at it. People with growth mindsets, on the other hand, approached new topics with an expectation of struggle and challenge, and knew from their past experiences that hard work could help them overcome what appeared to be impossible at first.

When you believe that you will face struggle and require work to reach a level of proficiency in anything, you can imagine how this affects the way you learn and grow comfortable outside of your comfort zone. A growth mindset creates the optimistic belief that you can achieve just about anything with hard work and time.

One of the foundations to better learning is the belief that you *can* learn better.

The next foundation is to understand the pyramid of learning, which you'll see traces of throughout this book. Many people have questioned the accuracy of the pyramid, but I would argue that it's not meant to be taken as an exact number, rather a useful guideline that demonstrates that really matters in retaining knowledge.

The pyramid is as follows:

- You retain 5% when you hear a lecture
- 10% when you read
- 20% from audio visual processing
- 30% from demonstrating [this and up are demonstration methods]
- 50% from group discussion [this and below are participatory methods]
- 75% from practice by doing
- 90% from teaching others

As you can see, the exact numbers may not be that important, but the differences in style are telling. The middle few might differ for many people, but the ends of the spectrum are absolutely true. The more you proactively process and participate in the analysis of information, the better you will retain and learn it. The more passively you intake information without a second thought, the less you will retain and learn. Would you learn more from surfing for two hours, or watching a movie about surfing?

Let's take two examples: one physical and one mental, to see how this works in real life.

If you want to learn how to ski, you aren't going to learn much from a lecture or reading. You might learn about the mechanics and why certain actions matter, but you won't actually be able to ski unless you do it. You demonstrate it for others, then receive immediately feedback, and you practice by doing so you can apply what you've learned. Obviously, for a physical act, we can see that learning is almost non-existent without moving down the spectrum toward active participation and analysis.

And now for the mental example.

If you want to learn more about the history of Spain, you might learn a good deal just from passively processing the information. You could take notes, re-read your notes, watch a documentary on Spanish conquistadors and Christopher Columbus, and easily be considered well-read on the topic.

However, imagine how much more you would gain if you were to dissect with others the motivations of the Spanish Inquisition, or create a video to demonstrate just how Columbus sailed across the Atlantic ocean. Further, imagine if you practiced rehearsing a speech about Spanish history that was meant to teach your co-workers. Finally, imagine that your co-workers were all Spanish, so they were going to pepper you with questions that you had to prepare for.

It's a different level of learning that occurs when you roll up your sleeves and really analyze a topic versus simply reading it. Remember, while the pyramid of learning isn't 100% accurate, it's accurate at the top and bottom levels, which create important distinctions in learning technique.

The next foundation to better learning is to understand focus. The attention and energy we can put toward learning is our most valuable resource because it's the most limited. We might have all weekend, but we might run out of attention span or energy to learn by Saturday afternoon. Therefore, we have to learn to extend our attention span and focus a bit better for better learning.

The first step in better focus is to give up your attempts at multi-tasking.

This could easily have been covered in the first chapter about myths, but I felt it fit better when talking about the quest for focus. When you attempt to multi-task, your focus, attention, and energy is spent switching between your tasks and re-orienting yourself to exactly where you were before you switched. It's like swimming against the current. Every time you take a stroke, you might only get one quarter of a stroke forward because of the current, and sometimes you might even go backwards despite your best efforts.

It's an inefficient use of your time that ends up in your becoming well-versed in the beginning stages of many tasks, but never quite seeing them to completion.

The better approach is to be willfully ignorant of everything else you need to do,

while giving full attention to one task at a time. In a sense, a lumberjack can only chop the tree in front of him or her, and can't do anything with a bunch of half-chopped trees. Chopping the tree in front of you will allow you to make better progress on everything more than actively working on it while multi-tasking. It's counterintuitive yet true.

The next step is to proactively prevent procrastination, and you can do this in a few ways. You can visually clear your workspace so nothing catches your attention and distracts you. You can impose a "one-touch" rule, which means the first time you see or touch a task is the moment you take care of it to completion. This is easier said than done. Finally, you must beware of what I like to call the trap of productive procrastination.

It's when we suddenly feel the need to vacuum our carpets or clean our bathrooms right when we have real work to do. It doesn't feel like a waste of time because in theory you are doing something positive and productive. However, it doesn't help your overall goal, and only assists you in avoiding something else. It may not be the worst habit, but it's something we don't realize we're doing to simply avoid more urgent or difficult work.

The final step to better focus is to pay attention to your attention. What do I mean by this?

Think of your attention like a muscle. You can't overwork it, and there is a limit as to what you can do with it on a daily basis. You can also train it to be bigger and better, and there are certain things that improve and discourage it. You can give it breaks and you can also recharge it.

The biggest takeaway should be that your attention is a limited quantity. You have to preserve it for the tasks that you need to get done. Whether this means saving it by avoiding other tasks, or preemptively removing temptation for your attention (such as television or objects to fiddle with) from your surroundings, you need to treat it like a battery that runs down throughout the day.

You can't learn well when your attention levels are shot, so take care to pay attention to your attention before you start, and during your learning. Sometimes you can't force yourself to push through, and that's okay.

The end goal of all of these foundations is to set ourselves up for success, and

success has been conveniently defined for these purposes by Noel Burch in the four levels of competency.

The four levels of competency are:

- Unconscious competence – We have incorrect intuition about what we're learning because we don't understand it at all.
- Conscious incompetence – We have incorrect analysis about what we're learning, because we only know some of the ground rules.
- Conscious competence – We have correct analysis but not habits or intuition yet, as we're only getting started with successful application of the ground rules.
- Unconscious competence – We have correct intuition about the future because we have seen and analyzed the application of the ground rules enough that we can understand what will happen before it happens.

The same examples from before clearly illustrate these levels of competency. You can only learn to ski when you understand the ground rules and develop habits to apply them, which gives you instinctual habits when you're skiing down a slope that is new to you. Likewise, you might understand Spanish history, but if you take the trends and analyze them, you can explain why certain events occurred and justify the current Spanish position in Europe.

Be aware that unconscious competence is where some people start from, and it's dangerous because they typically make terrible teachers because of their inability to explain their reasoning not based on a gut feeling.

The levels of competency and creating intuition mirror the true learning process in a nutshell:

1. Try
2. Achieve or fail
3. If you fail, analyze failure
4. Go to step one.

Where this process can go wrong is the following:

1. Try
2. Achieve or fail

3. If you fail, ***analyze failure incorrectly or fail to correct actions***.
4. Go to step one.

The pyramid of learning, four levels of competency, and better focus all contribute to ensuring that you don’t fall into the trap of the second, failing process.

Chapter 3. Know and Understand Thyself

The first and foremost step to being better at learning is to know thyself. What that means is to know and understand exactly how you learn and process information the best.

This may come as a surprise to some that people have very different preferences of how they learn. There are studies that show greater increased efficacy when exposed to a style or preference that best suits them.

You don’t need to take these guidelines as hard evidence, but the simple realization that you can engage information in different ways should greatly influence the way you learn. You might feel stuck in one way, only to shift to another medium and discover that it works much better for you. You might feel great in one method, shift to another and find that it takes you to the next level.

The point is to have more ammunition in your learning arsenal. If you were in a learning competition with someone else, and they could unleash all their learning potential, because they understood the three best types of information they responded to or knew how to engage themselves in three different ways, you will lose hands down if you have only stuck to one your entire life, even if you’re great at it and have it down to a science.

Think of it as if you only spoke French, yet you were forced to read all your news and watch television in Russian. After a few years you might be pretty good at it, and you might even have methods that work for you, but you’ll never be as proficient or efficient than if you could read and watch in French.

That’s what not understanding your best learning styles and preferences is like, and that’s the risk you run.

Let’s get down to it. In this chapter, I only describe two of the main models of learning. There are many more, but these are among the most widespread and prevalent. They further demonstrate that learning and expertise is not a one size fits all approach, and really, it can’t be unless you are simply shooting for minimum competency. Remember, while we go through everything presented, try to ask yourself if it sounds like something you might enjoy or something you might hate. Both distinctions are important to make.

The VARK Model of Learning

VARK is an acronym that stands for the four types of learning it splits people into. It was developed by Neil Fleming. The four types of learning are:

- Visual
- Auditory
- Reading/Writing
- Kinesthetic

If you have a visual style of learning, it means you prefer to see information so you can actually visualize concepts and how they may or may not connect with others. Try to summarize information in charts, graphs, or even pictures that get the point across in little to no time. At the very least, you can organize notes and information in a way that is visually organized for better absorption. Information that is merely heard or read just doesn’t make the same impact, and tends to go in one ear and out the other.

If you have an auditory style of learning, it means you like to hear information rather than see or read it. Hearing is the best way for you to process information because it allows you to process that information simultaneously with your own internal train of thought. Reciting information out loud is also helpful because it’s an active and conscious act, not like when others do it. It allows you to think out loud and come to conclusions and connections yourself, where you wouldn’t be able to through reading or writing. To work best, record people as much as possible, including yourself, and think out loud to find your conclusions.

If you have a reading and writing style of learning, you prefer to interact with text and manipulate it. It allows you to process information thoroughly and at your own pace. Reading over notes and making summaries of those notes will

work best for you, and tactics such as mindmaps also help, because they clearly allow you to make connections between concepts. To work best, you should always ask for a written copy, then annotate it yourself with your own notes and thoughts. That way, you can draw your own conclusions and see the evidence right before you.

If you have a kinesthetic learning style, you can't sit still for a lecture or lesson, and you want to experience the topic at hand. You need to try, poke around, and discover for yourself the inner workings of something because simply being told doesn't make much of an impression. You need exercises and problems to solve, trivia to name, and worksheets to fill in. This is the epitome of proactive learning, and it's no surprise that the kinesthetic learning style is effective for many people whether they realize it or not. It forces participation and active analysis, which is best for memory creation and retention. You work best through seeing demonstrations, then doing them for yourself to pick up anything you might have missed otherwise.

The Seven Learning Styles

The Seven Styles bear quite a few similarities to the VARK model of learning. There is actually overlap in the types of mediums that are mentioned, and for good reason: there are five senses and you can only appeal to them in so many ways. However, where the VARK model seems more conventional and concrete, the seven styles is more geared towards people's innate preferences and talents.

Without further ado, below are the seven styles of learning:

- Visual/Spatial
- Aural
- Verbal
- Solitary
- Social
- Logical
- Physical

Visual learning styles prefer to see pictures, images, movies, and are generally be able to visualize whatever they are learning directly. You will see through descriptions of the other learning styles that visual learners process information better with their eyes. Seeing something with your eyes is what cements it in

your brain. Even if you are reduced to reading or listening, you can replace the words with pictures, use bold colors to highlight areas of importance, and make your notes and outlines easy to visually comprehend. Suppose that you still want to learn the history of Spain. You'd be best suited to studying nautical maps, graphics, charts, seeing movies, and any other visual media that keeps you from having to solely read or listen. Turn your lecture notes into diagrams that hold a lot of information, and make it so you can digest information from a single glance at your page.

Aural learners are also known as musical learners. This is important to distinguish, because the VARK method tends to lump them in together with auditory learners. Aural learners don't necessarily prefer listening for better learning, they prefer everything that underlies the appeal of their favorite music. Rhythm, patterns, rhyme, and melody. These are the people that will hum incessantly and make songs for themselves to memorize facts and dates. You might imagine this to be a small minority of learners, but in reality, this exists in all of us. It's why we sometimes can't get commercial jingles out of our heads. To better learn Spanish history, you would do your best to work information into existing or new songs and melodies, because they come to you easily and the information will be secondary to the music – which is a good thing.

Verbal learners are also known to be linguistic learners, which means they not only prefer words spoken out loud, they prefer to read as well. This type of learner has it easy at first glance because most of the information that is readily available is in book or lecture form. To learn better, you take what you've heard or read and write it out yourself to strengthen the connections within. To learn Spanish history more effectively, you would take a series of sample test questions and write the answers out and let the insight flow from your pen. If you prefer to use words, you should stick to words and boil any diagrams, graphics, or pictures down to simple descriptions that you can dive into with more detail later. Copious, organized notes that are scribbled over again and again would be normal for this type of learner. You should do your thinking out loud in written form and write questions for yourself to answer later.

Solitary learners represent a point of significant departure from the VARK model, which focused on the types of input that you could receive. The seven learning styles are more holistic definitions that focus on how you best process information. Solitary learners prefer to work alone and process their thoughts by themselves. Everything happens in their own head, and they create their own

materials and methods for self-study. They may interact with others, but when it gets down to the wire, they withdraw into a cave with themselves to make connections for themselves. They know what questions to ask themselves and where their knowledge gaps lie. When others explain concepts, it just doesn't have the same impact – they need to think through it step by step for themselves. To learn Spanish history better, the solitary learner would hunker down in a bunker, alone for days with a few textbooks and lectures.

The social learner is predictably the opposite of the solitary learner. They prefer to learn in groups, or with other people, so they can bounce ideas and concepts off them. They want to seek as wide a set of perspectives as possible because that will increase their overall understanding. They prefer to see variety, breadth, and diversity of opinion because that will leave no stone unturned. After confirming their questions or beliefs, they can then be confident in what they've learned. To learn Spanish history better, the social learner would engage in a series of role play or Q&A group study sessions where the information comes out in answers and not through strict reading.

The logical learner prefers to learn through making logical connections and seeing the underlying systems and reasoning. This is the type of person that likes math because there is a single correct method that, if followed, will yield a single correct answer. There is no uncertainty and almost everything can be explained in some logical manner. You would search for the motivations that create action, because understanding the entire context will help with learning the logic. To learn Spanish history better, the logical learner looks at the big picture context of why certain events occurred and the series of events that took place afterward as a consequence. You want to make sense of the world by being able to say, "Oh, that's why that happened. That's the rule," even though it's not always possible.

The physical learner prefers actual, physical stimulation for learning. To touch is to experience, and to experience is to know. Using their kinesthetic sense cements information because they are tied to strong feelings and emotions. Sitting stationary in a chair is the worst scenario for this type of learner. They'd much rather get up and interact with others, create materials, interact with demonstrations, role-play, and use their five senses as much as possible. They want to feel, which transmits stronger memories to them. To learn Spanish history better, the physical learner would prefer to explore with their hands as much as possible in museums, folk dance demonstrations, creating models or charts about Spanish history, and have group performances in front of an

audience.

This chapter presented two models of learning, with eleven separate ways of processing information. Which ones resonated with you, and which felt like ones you'd ignore as much as possible? Most people are a mixture of multiple methods, so you may take elements from a few of the eleven methods presented. What's important is to know yourself and construct a method of learning that best suits your preferences and needs. Only then can you begin to learn like Einstein.

As a final point, there has been increasing scrutiny and criticism about the validity of learning styles. Namely, that despite what people deem their styles or preferences to be, it makes no difference as to the overall retention of information.

Is this true? It may very well be. However, learning will always involve sitting still for extended periods of time, something people can withstand for only varying degrees. Therefore, it might be more helpful and empowering to view each learning style or preference as a tool or trick to make learning more captivating, relatable, or motivating than sitting quietly at a desk by themselves.

Chapter 4. Faster and More Efficient Reading

Without a doubt, becoming a better reader is tantamount to becoming better at learning.

You might hate reading, or it might be the opposite of your learning style and preferences, but you're not going to be able to avoid it. Most of your initial consumption of information is going to come through the written word, especially if you are taking your learning into your own hands. What you do with the information after you've consumed it is up to you, but you're still going to start any new learning venture by reading voraciously and consuming as much as possible.

It's the initial gatekeeper that prevents most people from getting into their learning groove. They'll look at a new book or even series of articles and determine it would take them too long to finish, so what's the point? The sense of instant gratification is destroyed when you read slowly or ineffectively. Learning about something new will appear to be a boulder of a task.

That's why becoming a better reader is so important. It's the first step that you'll have to take whenever you want to learn something new.

Being better at reading generally has three parts that I'll cover in more detail: speed, efficiency, and how much is retained.

Reading Faster

For most people that haven't studied speed reading on an individual level, attempting to read too quickly can result in greatly reduced comprehension. This means the faster most people read, the less they understand and can make use of.

This isn’t a book that will tell you to read as quickly as possible. However, there are a few small improvements you can make to continually tweak the speed of your reading, so what previously took days can now take hours to read and comprehend.

The first tip to increasing your reading speed is to decrease the sub-vocalizations you use.

A sub-vocalization is something you are probably doing right now. It is when you mentally say and hear the word you are reading. It’s a habit that is mostly unnecessary, though is helpful when you want to slow down for increased comprehension. The simple fact is we can understand and process a word more quickly than we can say or hear it. Putting a stop, or at least decreasing, your internal dialogue while reading will greatly help your reading speed. If reading out loud is the first and slowest level, hearing sub-vocalizations is only the second and slightly faster level.

The second tip to reading fast is to practice reading more than one word at a time. Reading word by word is slow and fairly ineffective and can result in incorrect comprehension because you focus on the individual word and not the contextual phrasing or meaning in the text. It’s the classic case of getting bogged down in the trees and not being able to see the overall forest.

Start with reading two words together at once. This will require practice, but when you start doing it, you will realize that you can absolutely don’t need to read each word individually. You can think of the two words as a contraction. When you get comfortable with two words at once, you can move onto three and four words, until you can look at a sentence that is ten words and reduce it to the two five-word phrases it contains. That’s the end goal: to be able to synthesize phrases like you would individual words. One of the keys to reading more at once is to make sure that your eyes are widened and dilated as if you are trying to use your peripheral vision.

The third tip on speed reading is to improve your visual focus. We constantly lose our place and re-read phrases, and even entire paragraphs, because we get distracted with what’s happening elsewhere. This causes you to regress or digress in your reading, which is doubly detrimental to your reading speed. It causes you to have to get back into, “What was this part about, again?”

The simple way to improve your visual focus when reading is to use a placeholder or pointer, such as an index card, pencil, or even your finger. Give your eyes a bulletproof guideline on where to be and where to flow, and they will follow. It will keep you on pace, and prevent reading regression to keep you more immersed in the subject matter.

As I mentioned, this isn't a chapter about speed reading. There are entire books about the subject and I don't want to do it a disservice. It's a chapter about better and more effective reading, and that's where we will move next.

Efficient Reading

This technique applies mostly to books, but also to longer articles and even blog posts.

The underlying idea is most of these books and articles tend to only have one or two big, relevant ideas, tops. Obviously this differs between topics, but there is generally a good reason most of these sources have a "conclusion" section which summarizes all of their findings.

The rest is usually case studies, anecdotes, speculation, or digressions. This is especially true with non-fiction books, as they can typically be summed up in one page if not for the multitude of case studies, examples, different ways of restating a single concept, and evidence and proof for the assertion. What do we do with this knowledge?

We can use it to read extremely efficiently. Your job with reading is to find those one or two big, shiny ideas and try to cut out the rest of the clutter. This means you don't actually need to read a book or article from beginning to end. In fact, that would be a mistake and waste of time.

Note this technique works better for longer pieces since you don't generally need to read shorter pieces more efficiently – they're short!

There are three steps to this technique, and I'll illustrate it with a book example.

The first step is to spend three minutes simply skimming the book's front and back covers, the table of contents, and summary of the book. Think of this as pre-reading the book, and in fact, you just might be able to get everything out of

the book in this step. Many books make their big ideas known up front. If you have time, then you might analyze the introduction or first chapter a bit because the big idea might be there, as well.

The second step is to spend roughly seven minutes skimming the book again, but in more depth. This is when you read the two paragraphs of each chapter to find the big ideas of each chapter, and the big pieces of evidence that support the big ideas. If you see a story or anecdote coming, that's a cue to skip ahead because they are usually only for illustration. During this step, you will also make note of sections to read in more detail in the next step.

The third step is to spend twenty minutes reading specific sections of the book in greater detail. You should know the big ideas from the book already, and you are now looking for clarification and what each chapter adds to the big ideas. Review the highlighted portions from the previous step and read them in greater detail. Then, finish this step by synthesizing what you've read and summarize it in five main bullet points, with three bullet points under each – tops.

Some people like to add to the fourth step of reading the first sentence of each paragraph in each chapter, but it is mostly unnecessary to your goal, which is to find the one or two big ideas! At this point, you should have a very clear idea of what's contained in the book, and it only took you thirty minutes. If you lack clarity about a certain concept, then you know exactly where to read it straight from the source.

Retain More

Retaining more of what you read is easier than people think. The problem is that most people see reading as a fairly passive activity. As in, they can just sit back and read, and somehow the information will stick in their memory banks.

That's not quite how it works, and for better memory retention and comprehension, you need to make reading a proactive task. The best type of reading is when you read with a purpose because that will keep you focused and alert as to the information in front of you.

Reading with a purpose also turns you into an asker of questions, which is paramount. After every chapter, page, or even long paragraph, there are a series of questions you can be asking yourself to make sense of the information, and

make more connections in a participatory manner.

For example, you might ask:

- How does this point relate to the chapter or book in general?
- What did I just learn?
- Why does this matter?
- What are the shortcomings of this?
- What is the counter-argument of this?
- What was necessary for this to occur?
- What is a one-sentence summary of what I just read?

If you are able to actively process these thoughts even occasionally throughout your reading, you will retain far more because the information isn't just a set of facts anymore. They have created a series of connections that you have justification and context on. It's the difference between hearing a bunch of musical notes and hearing an orchestra play together. It creates a bigger impact on your memory because they now have meaning to you through the analyzing questions.

One of the best ways to synthesize and retain information better is to try to predict what happens next, or what happens as a consequence of what you've just read. When you can pull enough information together to make an informed guess, it requires a level of thought and understanding that goes far beyond passive reading.

For example, imagine the kind of thought process you would need if you were to do this with a movie. You would need to think about the hints that were shown, the motivations and thought processes of the characters, what might typically happen in a similar movie, and why the previous scene influenced you. You could probably list all of these things if asked about the movie prediction, which shows that you are engaged and invested. We can do similar things when we learn. You don't have to make a correct or even good prediction, the important part is to think about what you've seen, try to create patterns, and analyze them.

Finally, to retain more when you read, start from the end. Don't read backwards, but read and review in a different order than how you initially consumed the information. For a book, start from the final points of the last chapter and work your way to the introduction. For an article or study, work your way from the conclusion back to the introduction. What's the point of this?

When you continually read something in the same order, you're creating tread marks in the mud. In other words, you are solidifying information, but only in that specific order and context. You might only retain and remember something if you read or remember what was immediately before or after it.

It's similar to listening to a song playlist in the same order, over and over. Eventually it all melds into one long song, and you can remember and predict the next song based on the current song. But, out of that order and context, you might not be able to remember or think of it.

When you read out of order and generally approach information from different contexts and angles, you dramatically increase the retention rate, because it's suddenly a three-dimensional picture instead of a flat set of facts.

Chapter 5. The Art of Taking Great Notes

Taking notes is not just writing down what you heard or read for later consumption.

It's how ideas plant themselves in your head and become part of your memory banks. The proper usage of notes allows ideas to plan themselves in your head and become concrete parts of your memory banks.

Notes are where your learning should always begin, and I don't mean reading other people's notes. When you consume information with the intent to learn, creating your own set of notes to review later is the first step that allows you to synthesize information in any meaningful sort of way.

There are a few different methods that you've probably tried over the years, including outlines, mind maps, and simply writing down every seemingly big point that you hear or read. Some of these might work for you, but there are almost certainly better ways to organize and intake information. Feel free to take notes on taking notes.

There are four main stages of effective and great notes. They are:

- Note taking
- Note editing
- Note analysis
- Note reflection

Many of us may never make it to the fourth stage, and many of us may not even make it past the second. But that goes to show how much more we could all get

from our notes.

The first stage of note taking is where you are just trying to capture all of the big concepts and details. You take them down however you can, and paraphrase arguments and details to support each big concept. Leave space after each section so you can add in additional detail later, and use bullet points and lists wherever possible. Make sure to note areas where clarification and later research is required.

It's best to take this initial set of notes by hand. You have to spend more time on each word you write, and you also have to be more selective with what you write, because you can't possibly write everything. It forces you to edit the information you are recording at the outset. Then, for the next stages, you can transfer your handwritten notes to any other medium – but the initial stage is always best by hand.

In the same vein, don't rely on transcriptions of full-out recordings of the information that you need. Always insist on taking your own notes so you can immediately summarize and analyze the important information.

The next stage is note editing, and this is the stage where you go back over your initial set of notes and thoroughly edit what you've written, go over everything and write it all out again. This helps comprehension and to find blind spots of knowledge.

Conduct additional research wherever necessary, and collect and organize your notes to fit together with everything else you have on the topic. Review more complex concepts and summarize them, highlight areas that need special emphasis, and make sure that you know where to find any information for easy reference.

The second stage is where you make your notes easy to understand and read for someone to pick up out of the blue without any prior knowledge on the topic. Remember, you are not designing your notes for the expert that is deep in the midst of studying. You are designing them to battle your fading memory, so you need to leave contextual clues and information to help yourself. It's also a good idea to leave references to page numbers, books, and articles in your notes where you can easily research for original source information.

The third stage is one that you may not have reached lately. The third stage is note analysis, and it's when you actively summarize each section and try to boil everything down to as short a snippet as possible. This is where you use memory techniques such as acrostics and mnemonics.

It's also where you attempt to connect each concept to the other, either as a consequence or by noting how they are related. The general idea of this stage is to gain a deeper understanding of your notes beyond a shallow recitation of facts. To do that, you can ask yourself how concepts fit together and why they were even mentioned in the same section. Ask how they help further your understanding and overarching goal for learning in the first place.

The final stage is note reflection. This usually involves discussion of your notes with other people to make sure that everything you understand is correct, and to create a further level of understanding by open discussion and group analysis. After all, two heads are better than one, and two perspectives are better than one. This can be a peer, or even a teacher or professor.

Focus not on the facts but on the analysis, summaries, and conceptual understanding that you reached in the third stage. They are what matter in the grand scheme of the topic, and they are what will allow you to make judgment calls in unfamiliar situations.

It's helpful to know facts about Spanish history, but it's far more helpful to understand the role of religion and imperialism, because that will allow you to understand the ecosystem of the day, and why the events occurred in that way. Seek feedback and —this is important— actively try to find gaps of knowledge or where you might be wrong. Attempt to poke holes in your notes and knowledge, which will allow you to reinforce what you're correct about.

The general trend is to not take notes passively, and understand that your task has only begun after you've taken them from your initial consumption of information. Each time you review, you also have to make an effort to make it as participatory as possible so you don't end up just skimming your beautiful notes passively and lazily.

When you review, give yourself a specific task as opposed to just "reviewing your notes." A specific task would be something like organizing specific concepts, looking for connections between other concepts, ordering the

importance of the supporting arguments to bigger concepts, or making a map of the concepts and seeing how they connect visually.

The most famous method of note taking is called the Cornell method, and it actually encompasses much of the aforementioned four stages of great notes. Here's how it works.

On your handwritten sheet for note taking, split it down the middle and into two columns. Label the right column "Notes" and label the left column "Cues." Leave a couple of inches empty at the bottom of the page and label that section "Summary."

You now have three distinct sections, but you will only be taking notes in the Notes section. This is where you take normal notes on the bigger concepts with supporting detail as concisely as possible. Make sure to skip some space between points so you can fill in more detail and clarification at a later point. Draw charts and diagrams and make lists where appropriate, and give your best effort to capturing what matters. You don't need to think about organization or highlighting while you are taking the initial notes. Just write what you hear or read, and give as complete a picture as possible.

After you're done taking notes, move on to the left Cues side. This is where for each section or concept, you filter and analyze the Notes side and write the important parts on the Cues side. Where the Notes side is more of a jumbled mess, the Cues side is a relatively organized account of the topic at hand – basically the same information is on each side. Write the main supporting facts and anything that matters, but in a more organized way. There is the added benefit of having to go through your notes immediately and synthesizing everything and drawing out what's important and what's not.

Finally, after you're done with the Notes and Cues sides, move to the Summary section at the bottom. This is where you attempt to summarize everything you've just taken notes on into a few top-level ideas and statements, with only the important supporting facts or exceptions to the rules. You want to say as much in as few words as possible, the reason being that when you review your notes, you want to be able to understand quickly and not have to deconstruct and analyze all over again. You want to be able to skim the Summary and Cues section and move on.

There are similarities between the Cornell Method and the four stages of note taking, but in each case, you have created your own study guide. Better yet, you also have the entire process you used to create it documented on the same page, from original notes to synthesis and summarization. You have a record of information that allows you to go as deep as you want, or refer to whatever you want.

Overall, taking notes is not a lazy, passive activity. That’s the real secret of great notes. They are intended to serve as something you can refer to, instantly understand, and be helpful, as opposed to having to decipher them. This takes work and usually won’t occur on the first pass through.

Chapter 6. Best Practices for Practicing

What is the instant way to become an expert at something after learning about it?

Practicing it! Much to the chagrin of children sitting angrily at their pianos across the world, practice is indeed the only way you will improve and rise to a level of expertise, even if you have the innate talent of Mozart.

However, just like learning, taking notes, and reading (most of what we have discussed in this book thus far), there are ways we think are beneficial and successful, and there are ways that actually are. In other words, we are most likely not practicing the best way we can, and if we are, we may not be doing it for the correct reasons.

Practice can sometimes be hard to quantify, because we generally think it refers to just repeating an action or doing something over and over until we feel better about it. While this is true, it's overly vague and doesn't lead to significant expertise because there's no purpose or system behind it.

Before getting to the finer points of practice, deliberate practice, and what really moves the needle in your practice sessions, I want to touch upon some more foundational practice tips you may already be familiar with. Throughout this chapter, I want to use the example of becoming better at playing an instrument: the violin.

The first step is commitment. Not just the commitment to practicing, but the commitment to not simply breeze through it and passively participate and go through the motions. Commit to 100% focus every time you practice. Commit to the knowledge it will be tiring and exhausting, and there is no easy way to

actually practice. Getting better at something involves straying outside of your comfort zone. It will involve no small amount of struggle. You will feel uncomfortable and lacking in your abilities when you attempt to climb higher and higher. So, commit to all of this. Violinists must commit to their fingers hurting and being sore, their arms cramping, their eyes hurting from reading notes, and overall frustration from their fingers not doing what they want.

Set the expectation of commitment and that it will be a challenge for you to overcome, not to be discouraged by.

The second step is similar. You must practice to the edge of your capacities. This means that there is an optimal level of practice difficulty you should aim for. Aiming too high will discourage you, and aiming too low will bore you and not lead to any improvement. You want to find the sweet spot that pushes you to the edge of your current abilities because you will feel encouraging triumph and accomplishment. For the budding violinist, this means to attempt to play and practice pieces that are slightly more difficult than you think you'd be able to play, or even a piece that has some very difficult parts, but is otherwise average in difficulty. Improvement typically doesn't happen in huge leaps (unless you are a beginner) – it happens in small increments. You should tailor your practice to this pattern and keep yourself motivated and realistic.

Third, it's important to keep giving yourself positive feedback surrounding your practice sessions. The nature of practice is naturally depressing since it involves no small amount of failure. When you have too many failures consecutively, you might eventually start to believe that you completely lack the ability and talent for whatever you are practicing.

Focus on what you've achieved and not what you failed at. Focus on where you started and where you currently are. Review and tally up how many hours you spend weekly or monthly so you can visually understand how much work you put in, and not feel like you're not working at all.

The budding violinist might record themselves on a monthly basis so they can see their improvement, or when they first start to learn a piece versus the point of mastery over it. Sometimes it's only when we see big contrasts do we feel satisfied with the work we put in.

Realize that improvement is never 100% linear, and you won't feel like you

clearly improve every session. Sometimes it might feel like you're taking a step back, but in reality, no one can perform 100% of the time. Just imagine how the stock market chart looks. There's a large upward trend, but there might be dips every once in a while.

Fourth, in addition to positive feedback from yourself, seek immediate feedback from others, negative or positive. This is so you don't build bad habits, or build upon incorrect assumptions and actions. You need to be able to correct your course, and addressing the flaw as quickly as possible is what makes the biggest impact before you internalize it. This allows practice to continue correctly into the future.

In fact, spend most of your time on negative feedback. You likely already know what you're good at. The negative feedback will uncover any blind spots you may possess and fix the weakest link of your chain. If you don't correct yourself, you are teaching yourself to do something wrong. It's a good idea to attempt to solicit feedback from someone who is (1) not naturally talented, and (2) close to your level of expertise because they will be able to give you highly relevant and articulate feedback, because they understand exactly what you are asking and doing.

We started the chapter with general guidelines for better practice, and now it's time to dive deeper into one of the finer points: deliberate practice.

Deliberate practice was a term coined by John Hayes of Carnegie Mellon University. In short, it describes the best way to practice is to break your main goal down into numerous sub-skills that contribute to the goal. Then, instead of rehearsing the main goal, focus on each sub-skill and bring them to the point of proficiency, one at a time.

For example, there are many sub-skills involved if you wish to perform a violin piece at expert proficiency. You must work on finger strength, finger speed, musical emotion and dynamics, performance skills, stage presence, memorization, and watching the conductor, just to name a few. Deliberate practice would be isolating each of those sub-skills and working on them individually for hours until they become a relative strength. When you are able to do this for each sub-skill, it can be said that you have fewer weaknesses, and your overall performance level will rise substantially.

Deliberate practice is the art of mastering smaller skills that contribute to your overall goal. A skill is only as strong as it's weakest link, and you are making sure that you have none. Can a racecar win races if it has a top of the line body and wheels, but engine of a 1980 Honda Civic? There's no hope without paying attention to each contributing component.

The practice of deliberate practice also teaches you to analyze the goal you are working towards, and what is involved in reaching it. You objectively assess what is and is not working and you can more accurately pinpoint your weaknesses and strengths. This is a valuable skill to learn in and of itself, because you are learning to break problems down and solve them.

Here's what deliberate practice looks like in gaining a new skill versus tuning up an existing skill: let's suppose that you want to learn how to lift weights in the gym.

Think about the sub-skills that are involved in lifting weights, then start attacking them one at a time.

You'd start by learning safety rules for each exercise you want to learn. If you wanted to learn fifteen exercises, this could take a while.

Next, you would learn how to do each exercise to get the most out of it. You'd learn proper form and what to look out for in each of the fifteen exercises. Learning techniques would be a specific sub-skill in itself for each lift.

Then, you would learn how each exercise contributes to your body and how to construct a workout that gives you a balanced physique. People respond differently, so this could take a few sessions in itself.

The contrast is going to a gym and essentially winging it by jumping under a bar and lifting without a clear purpose or understanding of what you're doing. You might even spend hours a week doing this, but unless you understand the proper safety, form, and technique, you won't be fulfilling your gym potential.

Many people think sheer hard work is what will propel them to the top. It's certainly a component, but most people who are working hard are merely developing the skill of hard work, not necessarily playing violin or lifting weights. Deliberate practice is the differentiating factor.

One final wrinkle in the argument for deliberate practice comes in the form of a study from Robert Duke at the University of Texas at Austin, who had pianists learn a complex passage of music, and noted the learning habits of those who performed best at the study's end.

The top strategies became clear.

Identification of problem areas, and subsequent emphasis and focus until the problem was nonexistent. The key for the best pianists was how they handled their problems and weaknesses. They weren't innately better or made fewer mistakes at the outset, they analyzed what they needed to focus on and rehearsed those specifics spots until they were no longer weaknesses. They made sure they didn't continue to make mistakes and learn incorrectly, and correctly identified what needed to happen to improve the piece as a whole.

It sounds remarkably similar to what occurs in deliberate practice.

Chapter 7. Elephant Memory Techniques

Improving your memory is one of the biggest steps you can take towards being an expert, learning better, and increasing your knowledge.

The term “improving your memory” by itself is actually hazy because we have different types of memory. What most people intend to do is improve their long-term memory, but it’s not always what happens.

It’s helpful to begin any discussion about memory talking about its components so you can understand how to better achieve your memory goals.

There are three types of memory and they have very different purposes.

1. Sensory memory
2. Short term/working memory
3. Long-term memory

Sensory memory holds both conscious and subconscious information you gain from your five senses. It helps you make sense of your environment and shapes your perception. However, you only remember or perceive these things for as long as they are necessary or useful, and that can be only a few seconds. These are mostly things we don’t really notice consciously.

Short term, or working memory, is information you consciously remember for short periods of time without rehearsing or actively trying to commit them to memory. For most people, studies have shown this is roughly seven items for up to thirty seconds. In other words, short term memory can hold seven items, but you will likely forget most of them after thirty seconds.

Imagine that you are trying to remember someone's phone number so you can dial it before it leaves your brain. You are relying on your short term memory to hold those numbers, and you can't hold them forever, so you need to rush to dial the number as quickly as possible. The same feeling occurs when we try to remember license plate numbers and shopping lists.

We instinctively repeat and rehearse the items to ourselves to try to push them into the final phase of memory: long-term memory.

Long-term memory is typically the end goal for whatever we try to memorize or learn. Long-term memory is essentially unlimited and forever, subject to how important the information is and how much it was rehearsed.

There are three steps that push information into memory: encoding, storage, and retrieval.

Encoding is when information is consumed and the brain links the new information to something familiar to make it meaningful and make it stay. Storage is when memories are retained, typically by practice or rehearsal of some sort. Retrieval is when you pluck the memory out of your memory banks and access it to use it in some way.

Short-term memory and long-term memory are stored in different parts of the brain. Short-term memory resides in the frontal lobe of the cerebral cortex, but information stored in long-term memory is first held in the hippocampus, then transferred to the cerebral cortex for permanent storage.

These are important because most of the reasons we forget are related to one of these steps of memory creation. For example, forgetting something in your short-term memory is a result of insufficient encoding, while forgetting something from your long-term memory is a result of faulty retrieval. This has been dubbed the forgetting curve by scientist Hermann Ebbinghaus.

Ebbinghaus posited that memories will fade or not be retained if there is insufficient rehearsal and practice. He estimated that people typically remember only 50% of newly learned information three weeks after exposure, and they remember only 10% eight weeks after exposure. Additional studies have confirmed that it's possible to retain up to 80% of newly learned information if

you review and rehearse it within twenty-four hours after exposure.

Our brains are always trying to make sense of the world through limited means. Our memory is selective and wants to filter out the useless chatter we experience on a daily basis. If you rehearse something and repeatedly expose yourself to it soon thereafter, it's a signal to your brain that this information shouldn't be filtered, and actually deserves some mental bandwidth.

In other words, if you learn something on Wednesday, the first time you should review it is later that night, and then every day after. Use it or lose it.

This is the basis for the technique generally accepted as most powerful and effective in increasing your memory: spaced repetition.

Spaced Repetition

Spaced repetition is just what it sounds like.

In order to commit more to memory and retain information better, space out your rehearsal and exposure to it over as long a period as possible. In other words, you will remember something far better if you study it for one hour a day, versus twenty hours in one weekend. This goes for just about everything you could possibly learn. Additional research has shown that seeing something twenty times in one day is far less effective than seeing something ten times over the course of seven days.

Spaced repetition makes more sense if you imagine your brain as a muscle. Muscles can't be exercised all the time, and then put back to work with little to no recovery. Your brain needs time to make connections between concepts, create muscle memory, and generally become familiar with something. Sleep has been shown to be where neural connections are made, and it's not just mental. Synaptic connections are made in your brain and dendrites are stimulated.

Here's a look at what a schedule focused on spaced repetition might look like.

Monday at 10:00 AM – learn initial facts about Spanish history. You accumulate five pages of notes.

Monday at 8:00 PM – review notes about Spanish history, but don't just review

passively. Make sure to try to recall the information from your own memory. Recalling is a much better way to processing information than simply re-reading and reviewing. This might only take twenty minutes.

Tuesday at 10:00AM – try to recall the information without looking at your notes much. After you first try to actively recall as much as possible, go back through your notes to see what you missed and make note of what you need to pay closer attention to. This will probably take only fifteen minutes.

Tuesday at 8:00PM – review notes. This will take ten minutes.

Wednesday at 4:00PM – try to independently recall the information again, and only look at your notes once you are done to see what else you have missed. This will take only ten minutes. Make sure not to skip any steps.

Thursday at 6:00PM – review notes. This will take ten minutes.

Friday at 10:00AM – active recall session. This will take ten minutes.

Looking at this schedule, note that you are only studying an additional 75 minutes throughout the week, but you've managed to go through the entire lesson a whopping six additional times. Not only that, you've likely committed most of it to memory because you are using active recall instead of passively reviewing your notes.

You're ready for a test the next Monday. Actually, you're ready for a test by Friday afternoon. Spaced repetition gives your brain time to process concepts and make it's own connections and leaps because of the repetition.

Think about what happens when you have repeated exposure to a concept. The first couple of exposures you may not see anything new. As you get more familiar with it and stop going through the motions, you begin to examine it on a deeper level and think about the context surrounding it. You begin to relate it to other concepts or information, and you generally make sense of it below surface level.

All of this, of course, is designed to push information from your short-term memory into your long-term memory. That's why cramming, or studying at the last minute, isn't an effective means of learning. Very little tends to make it into

long-term memory because of the lack of repetition and deeper analysis.

Just as an illustration of the applicability of spaced repetition, Paul Pimsleur discovered that for his audio-based language learning program, there were very specific pauses that led to increased learning. In other words, there were very specific intervals of time between the repetitions that showed better language learning and retention.

The intervals he discovered were: 5 seconds, 25 seconds, 2 minutes, 10 minutes, 1 hour, 5 hours, 1 day, 5 days, 25 days, 4 months, and 2 years. This shows the importance of repetition, especially soon after initial exposure.

Memories are much better created when they are processed and analyzed on a deeper level, because they form a vivid mental image versus a set of facts and descriptions that the brain filters as boring and useless.

Flashcards

Flashcards are one of the best ways to memorize information. They force recall, and they aren't passive. You must actively recall and state what is on the other side of the flashcard, and it's this act of accessing a potential memory that cements its status.

In order to make best use of your flashcards, commit to making two sets. The first set will contain mere definitions and single concepts. One word prompts for one word or sentence answers.

The second set of flashcards will contain as much information about a single concept as possible, so you will be forced to recall all of that with the prompt of a single word. This is also known as chunking information, where it's advantageous to your short-term memory (which can only hold on average seven items) to remember information as a large chunk, rather than as smaller, individual components. This means when you put more information on each flashcard, that set of information becomes one item versus five items.

When you go through your flashcards, put the cards you got wrong back into the middle or front of your stack so you will see them sooner and more frequently. This helps you work through your mistakes and commit them to memory more quickly.

Overall, you are familiar with flashcards and have likely used them, so there isn't much for me to add here that would teach you something new. Just make sure to understand flashcards aren't a passive activity. You need to actively recall the other side of the flashcard, recite it out loud, then strive to recall more from that single prompt.

Mnemonics

A mnemonic device is most commonly seen as an acronym, where the first letter might represent a word for each. You can make mnemonics for just about anything.

For example, the colors of the rainbow are far more easily remembered as ROY G BIV (red, orange, yellow, green, blue, indigo, violet).

Not much more clarification is necessary here, other than to note that while acronyms are the most common, you can create phrases as mnemonics as well. The point is to give meaning to something that you can more easily remember, and this can be different for everyone. Here are a couple more examples:

The classification system for organisms is far more easily remembered as Devoted(or some other D-word) King Philip Came Over For Good Soup **(**domain, kingdom, phylum, class, order, family, genus, species).

The order of the planets of our solar system: My Very Easy Method: Just Say Understand Now (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune).

The list goes on. The more vivid and outlandish the acronym or imagery, the better and easier to remember.

Stories

Creating stories, or using metaphors and analogies function on the same principle as mnemonics. They substitute a series of information that is difficult to remember with something simpler to remember that has personal meaning to you.

Here's a simple example of something that I've remembered for the past twelve years because of how it illustrated information so perfectly in my mind. Humans have two types of receptors in their eyes, rods and cones. One is for perceiving black and white, and the other is for perceiving color. Which is which?

Well, traffic cones are bright orange, while rods resemble the silver poles that hold up stop signs. Therefore, cones perceive color, and rods perceive black and white.

What you're doing is drawing out the main elements of something and putting it into something you understand and remember. Put it into a context that is so obvious to you that all you have to do is be prompted.

Find something with one or two striking characteristics, and think about how it can relate to Spanish history and say, "It's similar to the Inquisition because…" If a story has a good guy and a bad guy, you can characterize them as the historical figures. You can think about them in terms of the difference between motorcycles and cars. A particular aspect might seem like the process of baking a cake. The end result may remind someone of how your mother treated you when you refused to come home for Christmas that one year.

A picture of a tree might remind you of the geography of a country because of the curves of the branches.

You can use players on your favorite baseball team to memorize the members of a country's government. Who resembles whom and why? You can use a song to remind you of a history lesson because the song is about rebuilding.

It's also this active analysis and application of a story, imagery, or metaphor to your information that further helps memory become solidified. You're searching to tie new information into existing information in an engaging manner. You might even remember the thought process more than the story or metaphor itself.

Chapter 8. Make Learning Secondary

“That is the way to learn the most, that when you are doing something with such enjoyment that you don’t notice that the time passes.” – Albert Einstein to his son, Hans Einstein

There is a lot of wisdom to unpack in that simple sentence Einstein once uttered to his son, and it ties in directly with the focus of this chapter.

It’s a straightforward premise. If you are lucky enough to be consumed with a goal or objective, and achieving that goal or objective happens to require the acquisition of skills or knowledge, then you won’t even notice. Your learning and expertise become second nature, all in pursuit of that goal.

I want to briefly repeat the story I told in the introduction of this book. I had a very motivating goal of talking to a girl in my Spanish class, Jessica. She tended to turn around and ask me for help because she was perhaps the one person who paid less attention than me in class, so I vowed to get better at Spanish so she would continue talking to me.

In this pursuit for her attention, I studied Spanish like a madman, and even researched obscure references and vocabulary to impress her. I didn’t know it at the time, but I had made learning secondary, and the pursuit of my goal was my biggest priority.

I learned as a byproduct, and that is perhaps the easiest way of all to learn.

Here’s another example which involves my older sibling. When he was growing up, the Internet was just starting to become popular. Of course, with the Internet

came chat rooms, message boards, and all sorts of communication with people that weren't right next to you. It opened the world up for many people. I remember watching him sit at the family computer struggling to type.

One day he downloaded some sort of chat program, which I now realized was AOL Instant Messenger – the infamous AIM that nearly every adolescent, teenager, and young adult used at the time. It couldn't have been one or two weeks later that I walked past him at the computer again, and couldn't help but notice how noisy and busy the keyboard was. His typing speed had probably quadrupled in just that week since downloading AIM. He became nearly obsessed with chatting online, and that obsession translated into competency quite quickly.

He had made learning how to type secondary in pursuit of his primary goal of talking to his friends online more quickly! All he wanted to do was type faster so he could tell jokes with proper timing and not get beat to the punch line by his friends, and he found a way to get that done through typing more quickly. His accuracy and so-called technique would probably have been better if he attended typing classes, but he was an incredibly fast typist, with all credit going to AIM.

Here's a final example to illustrate that making learning second can lead you to learning and knowledge without you even realizing it.

This story is about one of my friends from college. When he was still living in the dorms, he was surrounded by people who happened to play the guitar. They had all learned at some point when they were teenagers, and brought their guitars to college to serenade women. Occasionally, they also lugged all of their guitars into the same room and jammed out to classic rock songs as a band.

Feeling left out, my friend asked if he could use one of their roommates' guitars when they weren't there. It wasn't a problem, so my friend began learning how to play guitar on his own, practicing the songs his dorm mates jammed to. It wasn't that he felt left out of wanted to fit in, he just saw music as a fun group activity and wanted to be able to participate.

The next time the group gathered to jam, he was able to join in on the fun, and when they went through various songs in their repertoire, he was able to learn on the fly and play quietly in the background before becoming more confident and playing more loudly. He started to bond with these guys, and learned more and

better guitar so the group could play more complex tunes and solos.

He is another shining example of why, if possible, you should make learning secondary.

Given the proper motivation, you can make it so learning and knowledge isn't a chore, and is rather a rung on the ladder to your overall goal and sense of gratification. What's more important when you have a bigger goal is that you focus on efficiently making something work. You might not be worried about the specifics as much, but you will probably have the same end result. From there, you have the choice to start deliberate practice, rehearsal, and fine-tuning everything, but simply having the right motivation this will get you to a point of competency and even make you stand out.

Skill, expertise, and learning can all come as a byproduct of your overall goal. What do we do with this knowledge?

Understand that a motivation other than learning and knowledge is your most powerful learning tool. You have to see the forest through the trees and understand the rewards and benefits of what your actions are leading towards. In essence, everything you learn, or want to become better at, is a tool on the way to your overarching goal or project.

Don't have a goal or project? Make one that will make the acquisition of a desired skill necessary, but not the primary focus. For instance, if you want to learn better geography, start playing board games that require such knowledge. If you want to get better at skiing, start entering small, local competitions which will force you to improve. If you want to get better a typing, play a game that requires quick and accurate typing. If you want to learn a language more quickly, watch television shows that require greater vocabulary.

Make learning the journey, not the end point.

It's important to mention that it's not wise to always rely on motivation or inspiration. Those require you to be in a positive state of mind, which isn't always possible. It also puts you in a mindset where you have a prerequisite to learning and focusing. You need to feel inspired, you need to feel motivated, or you need to be in the right state of mind. This, we all know, definitely isn't always possible.

That’s why I want to touch upon what I call the 10-Minute Rule. It works in two ways. First, if you don’t feel like doing something, just do it for ten minutes, then you can stop. Of course, you’ll rarely stop at the ten-minute mark because you’ll have built up momentum and destroyed what was keeping you lazy: inertia.

Second, whenever you feel like stopping a task or quitting for the day, just give it ten more minutes until you stop. You may not continue much past this, but giving yourself a specific deadline will make you want to finish as much as possible in that time, and it will make you just a tad bit more productive. Your motivation may be waning, but your discipline will keep you working.

The other big lesson of this chapter is that doing, using, and applying is the most important part of learning, hands down. Recall the pyramid of learning where the most passive methods of learning yielded the least memory retention. When you do, use, and apply your knowledge, you are at the bottom of the pyramid which is participatory and active. It’s more work to be sure, and most of us like to slide down the path of least resistance.

Doing and getting your hands dirty allows you to find patterns and make connections that observation and study would never show you. I’d go so far as to say you will never master anything without some firsthand experience. Dan Coyle, talent researcher and scientist, suggested that the rule of two-thirds is most effective when learning or acquiring a new skill. You should spend one third of the time reading and researching, and the other two thirds actually doing and practicing.

You can only learn so much about playing the guitar by watching videos and reading tutorials. Don’t expect to be able to play like Jimi Hendrix the first time you pick the guitar up if you don’t practice and do. If you’re a complete neophyte, then you need to start with research and bone up on the ground rules and boundaries. Then, go and do.

Knowledge from research by itself is useless without the experience to back it up. When you combine those two, you gain intuition and judgment, which is usually the true goal.

Chapter 9. How to CRAM

However many warnings or pieces of advice that advocate spaced repetition, or the notion to begin studying and learning ahead of time, many of us still won't.

That's for good reason. We get busy with other things and can't break our stride to review something even for five minutes. We have many other subjects to learn and study. We just feel lazy and tired at the end of a long day. These are all legitimate excuses.

We know this isn't the most effective way to learn, but unfortunately it's what we're stuck with sometimes. There's a saving grace – recall that most effective learning targets long-term memory. That's the main goal of spaced repetition, to make the leap from short-term memory to long-term memory, where you no longer have to rehearse or practice it to remember it. You can simply recall it with a bit of thought and it's in your brain for an indefinite period of time.

To cram for a test, exam, or other type of evaluation, we don't need material to make it to our long-term memory. We just need it to make it slightly past our working memory and be partially encoded into our long-term memory. We don't need to be able to recall anything the day after, so it's like we only need something to stick for a few hours.

This chapter optimizes for learning as much as possible in as little time as possible, while also ensuring that you can retain it. It's a difficult task, but if you're going to pull an all-nighter, you might as well do it in the right way.

Chunking

I discussed chunking briefly in the previous chapter, but it's more appropriate to discuss it in detail here. Chunking is the act of turning five pieces of information into one piece of information for the sake of memorization.

For example, which is easier to memorize: 3 3 5 9 1 0 or 33 59 10? That's how chunking works. You do it every time you try to keep an account or telephone number in your memory before you use it. You simply combine information on a conceptual or semantic level such that your memory has to hold fewer objects.

Recall that our short-term memories can only hold seven items on the top range. Chunking gets around this because where there was once six numbers to remember, now there are three. That's a type of chunking that is called grouping. You create something to memorize from seemingly unrelated and random pieces of information. Here are a couple more examples to illustrate how to use chunking to your advantage.

If you have a list of things to purchase, you can create a mnemonic device, like mentioned previously, where the first letter of each item forms a new word. If you want to buy pears, apples, bananas, and underwear, that forms the word PABU, which is easier to remember or write down.

For the same list of things to purchase, you can also just push the words together. If you want pears, apples, bananas, and underwear, you could try to remember the word "pe-ap-ba-un," which represents all of the information on the list. You're substituting four pieces of information for one.

Another example is to visualize a scene or environment where all the elements work together. See a picture mentally of a setting that contains all of the aforementioned items, and keep in mind there are four of them total. Where might you see three pieces of fruit and a pair of underwear? Perhaps a hoarder's kitchen table, or an obscene grocery store. The more vivid the setting, the more memorable it will be.

In each of these cases, you're creating something new, or referring to something already in your memory that reminds you of multiple pieces of information. Make a connection and create something meaningful, which is easier to remember. This is the reason raw data and information rarely ever makes it to

long-term memory. The moment you can see a pattern form, it is easier to remember.

Pomodoro Technique

The Pomodoro Technique is a focus technique that promotes undistracted work and planned breaks. It's straightforward. You look at your study time in thirty-minute blocks. You will focus, turn off your phone, and ignore all distractions for twenty-five minutes, and then take a planned break for only five minutes to give your brain a break to not run at full capacity. This is one block, and immediately after, you dive into another thirty-minute block.

Most practitioners of the Pomodoro Technique make it their goal to complete eight thirty-minute blocks, but you might find that difficult if you're new to the concept. My recommendation is to aim for three blocks at first, and see how you feel at that point.

The greater purpose of the Pomodoro Technique is to avoid multitasking, and wasting mental capital switching between tasks and backtracking, while you try to find where you were. This frequently will result in one step forward, and one step backward, and after a couple of hours, you might find that you've only made minimal progress across all your tasks. Complete attention and focus for twenty-five minutes, no small amount of time, will allow you to build momentum and really make way through your information.

What's more, it's pretty likely that you'll overshoot twenty-five minutes, in which case, you should take a ten-minute break after fifty minutes. There is absolutely something to be said for putting your head down and grinding for a bit.

The Pomodoro Technique also brings awareness to your need for breaks and distractions. It's natural that we can't sustain focus all the time. You can't sprint endlessly, you would need a break eventually before you burn out. Sometimes your mind is fried and full, such as when you start reading the same page over and over without really comprehending it. That's when you know you need a break. It's a natural part of the memorization and learning process, even when you are cramming.

Continually Summarize

Remember, there's limited time and limited space in your memory banks when you're cramming, so you need to consume and memorize as little information as possible that will impart as much meaning as possible.

The goal is to give meaning and association to smaller pieces of information. Essentially, you want to be able to cram a paragraph's worth of information and recall into a single sentence. The way to do this is to re-write and re-summarize your notes into shorter and shorter versions, until they can ideally all fit onto a single piece of paper (or even an index card, depending on the context). Ideally you also write this all by hand, because you are forced to be economical with your words when writing by hand.

Let's say you start with ten pages of notes, which you first summarize and condense into three pages. This will force you to analyze what's important and filter all the clutter in your subject matter. You'll also begin memorizing on a deeper level when you review your material with this type of goal. Then, you summarize the three pages into one page. The act of combing through your material and thinking, "Is this important and does this contribute to the overall point?" is just as important as the actual act of writing out the new summary version.

Finally, you might summarize your single page so it fits onto an index card, which will further force you to condense, filter, and analyze the important parts. By this point, you've essentially written your notes three additional times, but in a way that is friendly to your limited memory banks at the moment. What's more, it's not like you will only remember what is only on the index card. Each sentence and bullet point will have so much more meaning and information behind it because you've filtered it three times and thought about it deeply.

You're working with limited space, and continually summarizing your material is going to make the most of it.

Make Connections

Raw information on the page isn't going to make it to your memory very easily. What you must do is give meaning to it, make it relate to information you already know, and simply make it memory-worthy.

First, make sure you understand your material. When you comprehend something, it will be easier to cram into your brain than something that is a puzzle to you.

Second, actively seek to make as many connections to existing knowledge as possible by continually asking, “It’s like X, except Y…” It doesn’t matter if it’s not particularly related, just make a connection as to how they might relate. It’s this deeper analysis that hardcodes information, not the actual analogy, metaphor, or comparison. Additional questions to ask to make connections to existing information are, “It’s the opposite of X…” and “This has the following three elements in common with X…”

Third, reason out loud to yourself. This is where you use phrases such as, “So this X happened because Y…” and “Z only occurred because X…” You’re basically narrating how everything fits together. Understanding context and logical flow will help your memorization.

Use Space

You might not be able to do true spaced repetition if you are cramming at the last minute, but you can emulate it in a small way. Instead of studying subject X for three hours only at night, seek to study it one hour each three times a day, with a few hours between each exposure.

Recall that memories need time to be encoded and stick in the brain. You are doing the best imitation of spaced repetition you can with what you have available. To get the most out of your limited studying time, study something as soon as you wake up, review it at noon, at 4:00 p.m., then 9:00 p.m. – or similar. The point is to review throughout the day and get as much repetition as possible.

During the course of your repetition, make sure to study your notes out of order in order to see them in different contexts, encode better, and also use active recall versus passive reading.

Finally, make sure that you’re reciting and rehearsing new information up to the last minute before your test. Your short-term memory can hold seven items on its best day, so you might just save yourself with a piece of information that was never going to fit into your longer term memory. It’s like you’re juggling. It’s inevitable that you drop everything, but it could just so happen that you’re

juggling something you can use.

Chapter 10. Learning by Science

Though there have been studies interspersed throughout this book, much of it has been to buttress well-known truths about studying and other tips that generally wouldn't surprise you.

This chapter is a little bit different. It is dedicated to the science of learning – specifically, the unexpected conclusions science has yielded about learning that will likely surprise you. As an author, one of the complaints I hear most is that most studies don't really shed light on anything new, and they just confirm what we already know and do instinctually. Hopefully this chapter is a departure and gives you unconventional tips to increase your learning potential, and absorb knowledge like a human sponge.

Exercise Boosts Your Brain

This first scientific study might be less of a surprise than the others.

Separate studies by Professors Crook and Ratey have shown exercise to be beneficial for your learning and memorization efforts because of the extra blood, oxygen, and glucose delivered to the brain. The more it gets, the better it performs, unsurprisingly. This means your brain on a daily basis is not functioning at its peak. It's rather functioning in equilibrium and status quo mode in the absence of any dire need. Put another way, it's conserving energy for when you really need it, but exercise allows you to put your brain into this state of mind whenever you want.

Crook even went so far as to assert that cardiovascular health is the most important factor in learning and memory. Beyond delivering more nutrients to

the brain through increased blood flow, physical activity also releases neurochemicals that are beneficial in numerous ways. First, brain-derived neurotrophic factor (BDNF) is released, which assists the brain in cell growth and learning. Neurotransmitters like serotonin, dopamine, and norepinephrine are also released, all of which increase arousal, attention, and alertness.

Taken together, exercise puts the brain into a state of temporary amazingness where problem solving and information retention are second nature. How long is this temporary state? A study published in *Brain and Cognition* determined that you have somewhere in the neighborhood of fifty-two minutes of boosted capability, depending on how strenuous your exercise was. To capitalize on this type of brain alertness, you can schedule breaks where you increase your heart rate for every sixty to ninety minutes, because it's likely you are starting to fatigue, get bored, and ineffective at that point.

For best results, make sure that it's actual exercise and not just a walk around the block! A study in *Neurobiology of Learning and Memory* addressed this, and researchers found that people completed a task 20% faster after intense exercise versus calmer exercise. The bigger the physical toll, the more hormones and neurotransmitters are released to your memory's benefit. Just imagine how alert and aware you suddenly are if you are driving and almost get into an accident. That's the same sort of brain rush.

In another study, researchers discovered people who exercised three times a week over a period of six months, had an increase in the size of their hippocampus, which is the part of the brain that controls learning and memory. Physical exercise literally led to changes in their brain structure that led to increased memory capacity. This lends credence to the saying of healthy body, healthy mind. If you feel like you are mentally dragging, take a break to get your heart rate elevated. Treat it like a shot of caffeine without the dreaded hangover. Use your breaks to get some exercise and come back refreshed and ready to absorb.

Change Locations

This next study is about the phenomenon that studying the same material in different locations and environments helps memory retention.

A study by Robert Bjork found that information is remembered and encoded into

our memory holistically. This means that if you study Spain in an aquarium, your memory will associate the two subconsciously. Your memory will also associate what you wore that day, what you ate, the smells in the aquarium, and what stood out visually in your environment. They'll all be lumped together as far as your memory is concerned, with the specific information you are trying to remember or learn.

This means two things. First, that it is possible to evoke the memory of Spain just by being exposed to the same smells and visual stimuli. If they are part of your overall memory of the information, then they will act to remind you of the rest of it. In other words, if you studied Spain in an aquarium and see a picture of an aquarium, it's entirely possible to remind you of the information you learned about Spain.

Second, if you change locations frequently while learning and processing the same information, you are strengthening your memory because it will be associated with multiple locations, smells, and generally stimuli to make you remember it. The researchers deemed this increased neural scaffolding. The more stimuli that triggers that memory or information, the more deeply it is encoded in your memory like a growing web.

A 1978 study added support for the finding that the more stimuli present while you are learning, the deeper information is processed in your brain. There were two groups that had two study sessions. One group studied vocabulary in two different rooms, and the other studied vocabulary in the same room twice. The first group showed far better recall.

What does this mean for you?

You should change locations as frequently as possible while learning the same information. If you can't change your scenery completely, change what's on your desk, the music you are listening to – anything that impacts any of your five senses. The more change of stimuli, the more roots the information will take to your brain.

Scientists have found other links between what memories can be associated with. Ruth Propper of Montclair State University found that even muscle contractions, namely a clenched right fist, could be subconsciously associated with information and memory if done simultaneously. One group of participants

clenched a ball with their right fists while performing a memory task, while other groups either had no ball at all, or clenched their left fists.

The first group routinely performed the best. Why does this work? It could be similar to why changing locations increases memory retention, because the more stimuli, the more cues for the information. Propper also posited that clenching the right hand activates the left side of the brain, which is where memory is generally encoded and recalled.

Feynman Technique

This next point isn't quite the result of a study, but is named for Richard Feynman, one of the world's most famous physicists. That's close enough. The Feynman Technique is typically used for speedy and optimal learning. You can use it to figure out concepts for yourself and determine the vital information you lack, as well as explain complex concepts to other people. It has four steps.

Step one: Choose your concept.

The Feynman Technique is very widely applicable, so let's choose one we can use throughout this section: gravity. Suppose that we want to either understand the basics about gravity, or explain it to someone else.

Step two: Write down an explanation of the concept in plain English.

Is this easy or difficult? This is the truly important step because it will show exactly what you do and do not understand about the concept of gravity. Explain it as simply, yet accurately, as you can in a way that someone who knows nothing about the concept would also understand.

Can you do it, or will you resort to saying, "Well, you know… it's gravity!" This step allows you to see your blind spots and where your explanation starts to fall apart. If you can't perform this step, clearly you don't know as much about it as you thought, and you would be terrible at explaining it to someone else.

Step three: Find your blind spots.

If you were unable to come up with a short description of gravity in the previous step, then it's clear you have large gaps in your knowledge. Research gravity and

find a way to describe it in a simple way. You might come up with something like, “The force that causes larger objects to attract smaller objects because of their weight and mass.”

Being able to analyze information and break it down in a simple way demonstrates knowledge and understanding. If you can’t summarize it in one sentence, you still have blind spots you need to learn about.

Step four: Use an analogy.

Finally, create an analogy for the concept. Making analogies between concepts requires an understanding of the main traits and characteristics of each. This step is to demonstrate whether or not you truly understand it on a deeper level, as well as make it easier to explain. You can look at it as the true test of your understanding and whether you still possess blind spots in your knowledge.

For example, gravity is like when you put your foot into a pool and the fallen leaves on the surface are attracted to it because it causes a barely-seen impact. That impact is gravity.

This step also connects new information to old information and lets you piggyback off a working mental model to understand or explain in greater depth. The Feynman Technique is a rapid way to discover what you know versus what you think you know, and allows you to solidify your knowledge base.

Sleep Learning

You’ve seen those infomercials. “Listen to this tape in your sleep and wake up a genius and be fluent in French!”

Of course, those are 99% fraudulent, but that 1% represents an interesting recent finding. We can learn some things in our sleep, but there are specific boundaries of this learning. Professor Reber of Northwestern University split pianists into two groups and had them learn a new passage. Then, all the participants took a ninety-minute nap. For one of the groups, the melody was played quietly during sleep for only four minutes, while the other group had complete silence.

The group who had melody while they were sleeping ended up playing the melody 4% better and more accurately than the other group. That’s quite a big

difference for only four minutes of apparent sleep learning. Brain scans confirmed that there was increased activity while the melody was played, even during sleep, signaling memory processing.

It’s a fairly significant discovery, but can you really just play a recording while you sleep? Not quite. Reber went on to clarify, “As long as the memory is tied to a specific type of sound, it looks like the sound can re-activate and strengthen the previously learned information. It is possible this effect would help with strengthening memories from a classroom or lecture and that it could even help speed up second-language learning."

What does this mean for you? Well, you probably can’t learn new information in your sleep, but you can reinforce information you’ve already learned to some degree, as long as hearing sounds is enough of a cue to trigger your memories and thoughts. For example, reinforcing a foreign language would work because you could pick up on the distinct sound. You may not be able to decipher specific information, such as the quadratic equation, but you can recall it better if it you associate it with a specific sound.

Chapter 11. Smart Goals

We've established that learning has a few different components, from information consumption, memory retention, and actual doing. All of these elements contribute to becoming an expert, but there is a final aspect that has just as high importance.

Creating goals. Why do goals matter in learning?

Human nature prefers the path of least resistance. If you don't construct goals, or at least have an idea of the end point you seek, you won't be properly motivated, and you will likely only do the bare minimum that is required. If you're not trying to accomplish something with your learning or memorizing, then what's the purpose of making an effort at all? What will keep you focused and in check when you have other distractions?

What will keep you from whatever your definition of failure?

If you took a class that never had any tests or exams, would you bother learning or studying? If you put a goal in place, like an exam, then you'd behave very differently with your efforts.

Suffice it to say, goals can assist your learning, and in many cases take it to the next level. There is one method in goal setting that has proven to be heads and shoulders above all others. This is called the SMART method of setting goals, where SMART is actually the acronym S.M.A.R.T.

S.M.A.R.T. stands for Specific, Measurable, Attainable, Relevant, Time-bound. I'll take you through each of these elements separately to see how you can make more effective goals that will help your learning and memory retention.

Specific

Let's suppose you have the goal of losing weight. That by itself isn't a very specific goal. In fact, it's so broad and vague that if you lose even one pound, you could call your goal successful. It doesn't help with planning and preparation, and it certainly doesn't motivate you the way a specific goal would.

A better answer here would take into account exactly what you want to accomplish, such as, "I want to lose fifteen pounds and fit into the third notch of my brown leather belt."

This makes your goal real because you've placed a number on it and a specific benefit; it's no longer a vague concept. You've put it out there, and now you are capable of failure. This is the reason many of us don't define our goals too clearly. It's the same aversion to a negative reaction that will motivate you and push you to achieve.

You might also be specific as to the entire context behind the goal, which would include:

- Who is involved, if not only yourself.
- When you want to accomplish this goal by.
- Where this goal will occur, if applicable.
- Why you want to accomplish this goal.

The last point is the most important because it solidifies a clear benefit and desire from for reaching this goal. It gives you the long-term view of how your life will change, and can keep you focused when you are stuck or feeling despair. A clear "why" will power you and provide an energy boost because you aren't just starving yourself or eating broccoli, you are doing it for self-esteem, to fit into your pants, and to attract the opposite sex better. This is something you should articulate at the very beginning, because it shapes everything else.

Measurable

You need a mechanism for determining whether you are getting closer to your overall goal. You have to be able to tell whether there is incremental progress, and if there is a difference from your starting point.

With weight loss, this is straightforward. You only need to step on a scale to see if you are making progress towards your goal weight. For other goals, you need a similarly objective method to measure your progress and how far you've come.

This serves two main purposes. First, seeing progress is incredibly motivating and provides positive feedback. It shows your efforts have payoff, and your actions can directly affect your fate. The subtext is that it motivates you to try harder because thus far, there has been a direct causation from your actions to your goal. That's nice.

Second, measuring your progress keeps you accountable and on track. You can't rely on subjective judgment because you will probably default to the path of least resistance, or be able to otherwise rationalize your poor progress or performance. An objective measure like a scale will never lie to you, and it will never swallow your lies. It will just tell you if what's happening is or isn't good enough.

Attainable

When you set your goals, they must be something that is clearly possible at some point in time by you.

There is a fine line between shooting too low and too high. It can't be overly ambitious, because when you fail to adhere to that trajectory, you may become demotivated. If you shoot too low, then you aren't gaining much.

It's also important to consider what's involved in attaining your goal. A good goal is not something that *could possibly* happen in the future if other circumstances align. It's something that, if you are pushed out of your comfort zone a bit and control what you can control, has an extremely high likelihood of materializing.

When you set the initial goal, factor out everything out of your control. What can you plausibly control and manipulate to your advantage? That directly influences what is attainable, but make sure that you aren't shooting too low to compensate for what is out of your control.

You also need to think about the changes required to achieve your goal, both in your environment and your personality towards things. What would it take to

completely change your environment, and what skills or tools would you need to attain to achieve your goal? Take inventory of yourself. If you want to lose weight, and you are surrounded by friends who all eat terrible fast food every day, and you don't possess a gym membership, what steps are necessary to change your environment and personality?

This keeps you accountable because you won't be able to blame anything external – you have sole responsibility for whether or not you attain your goal.

Relevance

What is the relevance of this goal to your life, overall goals, and happiness? Why does it matter and why do you want to achieve it?

This is similar to the "why" we discussed earlier. You need a compelling "why" because it's what will keep you motivated and on target through the struggle of reaching your goal. Often, we may have trouble articulating these because they are tied to improving our emotional states, i.e. "I want to lose weight because I feel embarrassed and lack confidence."

If you lack an overarching goal or emotional motivation, it's incredibly easy to veer off the path to your goal because there's no backlash. You won't feel like you're missing out on anything.

Time-bound

You must be able to impose a deadline for reaching your goal. A goal without a deadline is just a dream or, at best, a statement of intent. If you don't have a deadline for your goal, you won't have any urgency or reason to take action *today* instead of tomorrow or next week. This is key to actually carrying through.

Anyone can set goals, but if they are ambiguous as to timing, it's probably not intended to succeed.

If you have a longer-term goal, it can also be helpful to set deadlines for milestones throughout the course of the year so you are aware of where you should be at a certain time. This will provide further check-ins to keep you accountable and impart a sense of urgency.

If I want to lose fifteen pounds in the next year, I want to lose five pounds every month, which is 1.25 pounds every week. It provides much more clarity.

Now that we've gone through each element of S.M.A.R.T. goals, let's go through a few examples to see how they differ from "poor", but exceedingly common, types of goals.

Bob says, "My goal is to start a business!" with no further clarification. This goal is so broad that we don't even know what he is referring to, much less how likely it is to succeed.

Let's take Bob through the steps and create a S.M.A.R.T. goal for him.

- Specific: I want to open my own lawnmower store.
- Measurable: You can measure this goal by the money the business makes: I will make $10,000 in the first six months of opening my business.
- Attainable: This is attainable, but I need to hire a lawyer and accountant, ignore my family for a while, talk to my mentor more, and change my schedule so I can visit stores every weekend.
- Relevant: This store represents my freedom from being an employee and hopefully will eventually fuel my retirement.
- Time-bound: I want to sign the lease on the store itself in the next two months, and start selling products one month after.

Where Bob once started with "My goal is to start a business!" he now has "My goal is to open my own lawnmower store within two months and make $10,000 within the first six months, and work for myself for the rest of my life."

Here's another example: Elaine says, "I want to become famous in my field." What is her S.M.A.R.T. goal?

- Specific: I want to be the most famous tax attorney in my state.
- Measurable: You can measure this goal by how frequently you are asked to be interviewed or speak on tax issues, as well as how much business you have.
- Attainable: This is attainable, I will need to hire a public relations firm, start writing for newspapers and magazines, and network with

fellow attorneys that have sway.
- Relevant: If I can become the most famous tax attorney in my state, I will have a never-ending flow of business and I will be able to stop worrying about money.
- Time-bound: I want to accomplish this goal and have four interviews a month by the end of the year.

You can see how many more elements come up when thinking through your goals, and how going through the S.M.A.R.T. process essentially provides a blueprint for what you need to do. Not only do S.M.A.R.T. goals have a higher chance of success, they can tell you exactly what you are looking for.

S.M.A.R.T. isn't the only guideline that will help you with your goals.

First, sometimes it's better to make goals and success about the effort, and not necessarily the achievement. In other words, it can be motivating at the beginning to make a success just doing something versus doing it well. Just getting to the gym and jogging for ten minutes is a success. Aim for that, versus lifting heavy weights for two hours, as might be ideal to some. Effort and consistency is underrated in goal completion, so make sure to reward it.

Second, your willpower to achieve your goal has limits. Think of it as a battery pack that runs down at the end of the day. This means you should preemptively avoid temptations and distractions, and make it as easy as possible for you to work on your goal. For a weight loss goal, this would mean making it easy to eat healthy and workout by packing your lunch, and always having clean gym clothes, and avoiding buying snacks altogether.

Third, make sure the goals you set are because you want them. Don't set goals that are from other people, or ones that you are bound to by a sense of duty or obligation. You're not going to have a very compelling "why" to motivate yourself to achieve them, and they might be a waste of your precious time. The more a goal is for someone else's expectations, the more of a chore it will feel like.

Finally, don't forget to review and monitor your progress, starting from day one. Often, we are completely blind to incremental progress just because we can't notice the difference. Whatever medium is appropriate, record yourself right from the beginning. You can make it visual so you can tangibly see and

appreciate the difference. The point is to incorporate encouragement as a result of seeing your progress.

Chapter 12. The Trio

Sadly, we have come to our last chapter on learning, but fear not. This last chapter provides some short yet powerful tips to learn and memorize better.

Incubation

Ever wonder why you get so many ideas when you are standing in the shower?

Shelley Carson of Harvard University came up with the answer. It's counterintuitive, but it's because you are distracted by the shower.

Here's what happens when we over-focus and fixate on something. We become bored and burnt out, and start looking at it from only one perspective or path of possibility. We find ourselves unable to think differently, like we are stuck in the deep tread in the dirt that repeated traffic from a tire creates.

When we disengage and become distracted by something else that is relatively relaxing, such as shampooing your hair in the shower, that's when a period known as incubation begins. Your conscious brain has stopped thinking about the problem, but it's still ticking and processing under the hood. Disconnecting can essentially put the mind into a state of unconscious pondering and connection. Your brain begins to passively approach the problem from other perspectives and paths that were different from what you fixated on consciously.

This subconscious brainstorming session can lead to flashes of insight that only required a simple shift in perspective or angle. What does this information mean for you?

The theory of incubation is an argument for taking regular breaks, especially if you are stuck on one particular problem or solution. It's not a guarantee you will witness a strike of lightning, but you will at the very least come back refreshed and ready to attack it again from different angles.

Breaks are more productive if you can position them as recovery and subconscious processing, as opposed to rest. More time spent staring blankly at your work is not time well spent. In fact, scrolling down your social media accounts for fifteen minutes might not be such a bad thing – as long as it's to take a break from something you've been stuck on for a while.

Incubation suggests that we learn and process information on both conscious and subconscious levels, and not always simultaneously. In other words, much of the time we are processing information subconsciously while ignoring it consciously, doing another task, or becoming distracted.

It sounds strikingly similar to spaced repetition. This is something we can use to our advantage if we strategically study and learn throughout the day.

In the morning, start tasks A, B, and C. Dedicate time to each of them. Start each task, take notes, and fully dive into each. For example, if you're a writer, your tasks might be three different articles in the morning. Do your initial research, write outlines, and do some initial analysis. Spend an hour on each article. This is your conscious track of thinking and processing, but your subconscious mind will already be thinking about the prior topics.

Then break for lunch, and generally become distracted with low-demand tasks. Your subconscious track of thought is still working and churning. This is when incubation occurs, and often you will have ideas of how to approach each of the articles. It's as if your brain makes connections when you aren't actively working on them. Make sure to be ready to take notes and record thoughts during this incubation period. You may not have worked the articles, but your subconscious did.

When you get back to writing your articles, you will have increased insight on how to write them courtesy of your subconscious. Numerous studies have shown conscious multi-tasking to be a myth because people typically expend their mental bandwidth switching between tasks and re-orienting themselves.

Incubation might be the only case where multi-tasking is relevant because it's done on a subconscious level.

Teaching

Now that you've learned how to learn and memorize effectively, it's healthy to look at the other end of the spectrum to examine what we can do to become better teachers ourselves.

This section encompasses many of the tactics you've used for yourself, but you'll find they may be slightly different when teaching others.

When you are teaching, you want to focus on comprehension over memorization or breadth. Full comprehension is the foundation upon which everything else is built, because it allows you to make predictions, use intuition, and think critically. Flat facts don't give context or provide actual knowledge. Starting with memorization reduces everything to flat, boring information, while breadth promotes information over context or understanding.

Comprehension can be improved with the Feynman Technique as covered earlier, in conjunction with continually asking for simple explanations and summaries for each aspect of what you are teaching. The longer the explanations are, the less people understand and are trying to talk *around* the concept.

As the teacher, it's a matter of asking the right questions so people will not only focus on the important parts, but they will also make connections and view information in a relatable manner. You must be the one to draw it out of them. For example, you can ask the following questions to drive your points home:

- What was the main point of this concept?
- Can you summarize this?
- Why does this matter?
- How does this relate to the main point?
- How does this concept connect to the next?
- What happened before, and what will happen after?

You can also play devil's advocate to force people to articulate their thought process and reasoning. These all drive concepts deeper than rote memorization or lectures.

Be sure to accommodate for people's learning styles. Remember there is some debate as to whether learning styles are a legitimate differentiation, but also recall that you can see each style as a tool for increased engagement and interest. In fact, evidence throughout the book has shown that using multiple types of media and stimuli are best for retention, because of the increased neural scaffolding that occurs. In other words, the way more information is consumed, the more likely it is to stick and be useful.

Place a premium on repetition throughout the day. As opposed to a three-hour block of intense study on one topic, divide it into one-hour blocks on consecutive days. This requires foresight and smart planning to take advantage of the benefits of spaced repetition. To emphasize repetition, create flashcards and place a requirement of active recall, rather than re-statement and reading. The upside of this more mentally fatiguing manner of study is that you can accomplish more in less time, so the sessions may be much shorter.

People are typically in need of motivation, and you can provide that if you again ask your students the right questions. Just like you need your compelling "why" to see the forest through the trees, so will your students.

- Why/How will your life improve from this?
- Why do you need to learn this?
- What are you gaining from this?
- What reward will you get, or punishment will you avoid?

Perhaps most important with teaching, it's not necessarily about the end point or achieving a goal. Sometimes, just to galvanize someone into giving an effort should be considered a success. It may be frustrating, but you are teaching for your student's benefit, so your impatience has no part in it. If you can give them positive feedback and move the goal posts so their effort is rewarded, they will feel more willing about their learning process.

Your Biggest Obstacle

I saved the biggest and best for last. Your biggest obstacle to learning will almost always be yourself and your sense of pride in one way or another. Consider someone who wants to learn to skate.

She wants to learn, but the skating rink is always full of people she knows from school. She doesn't want to fall in front of them. She has lessons, but doesn't venture outside her comfort zone because she doesn't want to feel embarrassed. She only ever does things she is completely certain she will succeed at. As you can imagine, this results in barely perceptible, incremental growth. She feels like her quest of learning to skate has become pointless because she is not improving, and she quits and takes up golf.

What's the lesson here?

Her pride kept her from learning because she didn't want to look bad in front of other people. In fact, she abhorred the thought, and wouldn't even allow the thought of embarrassment to enter her mind. It kept her from learning.

We do similar things all the time, and they greatly hinder our ability to learn and accomplish as much as we truly can.

We are sometimes unable to admit when we are wrong, even if we know we are, because we don't want to *lose face* or be characterized as the loser in an interaction. We close our minds and ears to the correct path because we want to be seen as a smart winner.

We, like the skating student, sometimes feel the need to look good in front of others. We want to maintain an air of superiority, and are incapable of showing vulnerability for fear that we will be picked apart mercilessly. This is why many of us despise asking questions in front of others. We think we will be judged, and we would rather be wrong and not learn than lose the pretense of understanding and intelligence.

We sometimes refuse instruction altogether because we don't want to be put in a lower position, so to speak, to someone else. We don't give them permission to show us, and we carry on doing things the wrong way simply because we don't want to feel wrong or dumb while being taught. We feel that needing help is a sign of weakness, and we want to do things ourselves to show our strength and confidence. Little do we realize that this is frequently what leads to overcompensating behavior, and it's extremely apparent to most bystanders that we are trying to cover something up.

We frequently make excuses for our own behavior or failures. Sometimes it's

uncertain who we are trying to convince: ourselves or other people. We'll attribute our failures to other people or external circumstances, never holding ourselves accountable or seeing where the responsibility really lies. Better yet, we are smart enough to come up with *smart* excuses to rationalize behavior – excuses that other people will believe, and that you might even believe sometimes.

Finally, we are afraid of appearing like we don't have the answers, so we act like we have them all. We aren't open to alternative solutions because we feel like they invalidate our intelligence, which leads to glaring blind spots and knowledge gaps, because we ignore other perspectives. It's never okay to answer with "I don't know" because we feel like that denotes ignorance and stupidity. We desperately want to be seen a certain way, and those people always seem to have answers. Of course, we don't realize that those people say "I don't know" more frequently than anyone to foster discussion and find the answers.

Chapter 13. Albert Einstein’s Logic Riddle

Einstein wrote the following riddle. He stated that 98% of the world could not solve it. This may not have been a riddle that was supposed to indicate intelligence, because others have implied that it just requires attention and patience:

There are five houses in five different colors in a row. In each house lives a person with a different nationality. The five owners drink a certain type of beverage, smoke a certain brand of cigar, and keep a certain pet. No owners have the same pet, smoke the same brand of cigar, or drink the same beverage.

Other facts:

1. The Brit lives in the red house.
2. The Swede keeps dogs as pets.
3. The Dane drinks tea.
4. The green house is on the immediate left of the white house.
5. The green house's owner drinks coffee.
6. The owner who smokes Pall Mall rears birds.
7. The owner of the yellow house smokes Dunhill.
8. The owner living in the center house drinks milk.
9. The Norwegian lives in the first house.
10. The owner who smokes Blends lives next to the one who keeps cats.
11. The owner who keeps the horse lives next to the one who smokes Dunhill.
12. The owner who smokes Bluemasters drinks beer.
13. The German smokes Prince.
14. The Norwegian lives next to the blue house.
15. The owner who smokes Blends lives next to the one who drinks water.

The question is: WHO OWNS THE FISH?

Skip ahead for the answer.

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The German sits in his Green House, smoking his Prince cigars, drinking coffee, and watching his FISH.

The rest goes like this:

1st House: Yellow, Norwegian, Water, Cats, Dunhill
2nd House: Blue, Dane, Tea, Horse, Blends
3rd House: Red, Brit, Milk, Birds, Pall Malls
4th House: Green, German, Coffee, FISH, Prince
5th House: White, Swede, Beer, Dogs, Bluemasters

Conclusion

What started with a misguided attempt at talking to Jessica from Spanish class has turned me into what some would call world class at learning and teaching – at least, that's what my clients tell me.

I hope you take these lessons and use them to learn better and cram more knowledge into your head than you ever thought before. What you have to remember is that it won't be easy at first, and it will feel like you are learning how to learn all over again, just like a toddler.

Soon though, you will realize that you are retaining far more than usual, reading faster, and becoming generally more knowledgeable, in seemingly less time. Your friends will ask you for your secrets at how you are achieving top grades while working less than them.

Your answer? Learning how to learn.

Best of luck,
Peter

Summary

Chapter 1. Shattering Myths

There are a few myths about learning that hold us back unintentionally, and keep us from our potential. Among them are thinking that failure is always bad, that our learning abilities are capped by our intelligence, and that more studying and exposure is always the better path.

Chapter 2. Foundations for Better Learning

As a precursor to improving your learning, you must be aware that multi-tasking is a complete myth, and learn techniques to focus yourself and pay attention to your own attention. You will see how you should generally approach and structure matters through the pyramid of learning and four levels of competence.

Chapter 3. Know and Understand Thyself

If you don’t know yourself and what you prefer, you are forever operating through inefficiency. There are a few models of learning styles and preference, highlighted by the VARK and seven styles models.

Chapter 4. Faster and More Efficient Reading

Better reading is a matter of speed, efficiency, comprehension, and retention. You can train speed reading separately, while the other factors are a matter of analysis and active participation in reading rather than passive.

Chapter 5. The Art of Taking Great Notes

Taking better notes consists of four phases: taking, creating, analysis, and feedback. You can also use the Cornell Method of taking notes.

Chapter 6. Best Practices for Practicing

Deliberate practice is the key to truly growing expertise in something. Analyzing negative feedback and practicing at the edge of your abilities are close behind.

Chapter 7. Elephant Memory Techniques

Most people want information to make it to their long-term memory. Spaced repetition is the best method for memory retention, while flashcards, mnemonics, and constructing a story narrative with information also help.

Chapter 8. Make Learning Secondary

If you can set out to accomplish a goal that just so happens to require skill acquisition, this is the easiest way to learn – by making the learning secondary.

Chapter 9. How to CRAM

Cramming is the attempt to stuff as much information into the hazy area just short of your long-term memory, but beyond your short-term memory. Chunking, summarizing, and making analytical connections between concepts are your best bets.

Chapter 10. Learning by Science

Science can often reveal counterintuitive ways to learn better. Separate studies have shown that exercise boosts your brain power, changing locations helps memory retention, the Feynman Technique helps you learn what you don’t know, and you can actually learn some things during sleep.

Chapter 11. Smart Goals

The best types of goals are S.M.A.R.T. –an acronym that stands for Specific, Measurable, Attainable, Relevant, Time-bound.

Chapter 12. The Trio

A final set of tips for learning come in the form of incubation, how to teach more effectively, and why your biggest obstacle to learning just might be your ego.

Chapter 13. Albert Einstein’s Logic Riddle

No spoilers here!