

FREE FIRST CHAPTER

THE ART OF SELF-LEARNING

Genes And Dreams

Tried-And-True Self-Learning Techniques To Expand Your Horizons — Chapter One. About a 20-minute read.

You aren't a prodigy.

You probably wouldn't be reading this book if you were. After all, success comes to prodigies easily. They are good at investing, math, or chess from a young age and only get better over time. They spend little effort reflecting on how and why they are learning or how to get better at it.

You, on the other hand, have had to work hard for each of your successes. Some successes were probably easier than others, but each one still required your effort and focus. You have faced significant obstacles to get where you are today. That's a good thing: it means that you are driven, dedicated, and able to make difficult choices.

Now, you're faced with a new challenge: self-learning. You know that you want to learn and expand your horizons. You also know that simply wanting to learn isn't enough. You need practical, research-based strategies that will help you achieve your goals. That's where this book comes in.

Everyone has a reason to want to learn more. Maybe you want to learn more about good management, psychology, or your current field to progress at work. Maybe you want to become better at saving and investing to safeguard your finances better. Maybe you want to become fluent in another language, get better at your favorite sport, or pick up an instrument again to enrich your life. Maybe you simply want to expand your horizons.

Whatever your reason is for learning or your chosen topic, learning is easier said than done. You probably face huge pressures in your life. Work, family, friends, and other obligations take up a lot of time. When you finally finish everything you need to do each day, are you really in the mood to learn something new? Probably not. Because of this, it can be extremely difficult to complete your learning goals. Maybe you've even tried to teach yourself before and given up.

You are not alone in this — almost everyone who wants to learn and be successful faces similar struggles. Time, lack of motivation, and outside pressures affect everyone. Luckily, there is a light at the end of the tunnel.

Years ago, one man faced adversity on an intense scale. He failed in business. A few years later, he suffered a nervous breakdown. Then he ran for president – and was defeated. If you only followed his life until this point, it seems like he failed at everything he tried.

A few years later, however, that man was elected president. Then he led the abolition of slavery. You know him as the former American president, Abraham Lincoln.

Similar stories are everywhere. People face failure, give up, begin again, and only then achieve success. And many of these people use similar strategies, strategies which you can use, too. If you practice in the right way, keep yourself motivated using tried-and-true techniques, and seek the most helpful kind of feedback, you too can achieve your learning goals. In this book, we'll cover the simple steps you can start today to learn better and more sustainably.

In chapter 1, we'll begin by covering the reasons why some people seem destined for success. How much of talent is based on genetics? How does learning actually work in your brain? Do you have to start young in order to achieve success?

In chapter 2, we'll look at goals and motivation. Step-by-step, we'll walk through how to set good, sustainable goals and how to avoid common mistakes. We'll also look at how to keep yourself motivated, even when outside pressures add up and you face mistakes and challenges.

In chapter 3, we'll get down to the facts of learning. We'll first address, and disprove, the most common learning misconceptions. Then we'll discuss the three simple learning strategies that work best.

In chapter 4, we'll talk about the importance of practice. Most people are practicing ineffectively, which leads to bad habits and learning struggles. Instead, you can use this chapter's techniques to make sure your practice is doing what you want it to. Plus, these strategies work for anything you want to learn, from psychology to music.

In chapter 5, we'll look at giving and receiving feedback. How and why is support from experts needed? How can you find experts to help you? And how can you eventually become an expert yourself?

By the end, you'll know exactly what you need to do to learn about your topic, whatever your topic is. You'll have the most important strategies needed to make real progress. And you'll know exactly what to do when you face pressures like lack of time, mistakes, and stalled progress.

I know personally about the difficulties and successes of self-learning. Until the age of fifteen, I was homeschooled. That means that, throughout my childhood, I taught myself almost everything I learned. I taught myself how to write (which didn't go well, as we'll discuss later). I taught myself math, history, and physical education. In doing so, I made just about every mistake that it's possible to make.

As an adult, I became fascinated by education. Looking back at my past and current self-learning, I wanted to know exactly how we learn, and how we can do it better. So, in college, I studied psychology. Even now, I continue to learn about learning itself, as well as about other topics.

With this background, I am uniquely qualified to discuss how best to learn. I know every mistake, misconception, and possible obstacle, because I've been there myself. And, even better, I know how to get past those roadblocks to a more successful future.

This book will cover how to get and stay motivated and how to achieve your learning goals. It will address common mistakes and misconceptions. It will give a roadmap for how to learn well that can work for anyone. It will show you the science behind how learning really works in your brain and how you can do it better.

However, this book won't teach you about a specific subject (unless your subject of interest is learning itself). After reading this book, you'll be prepared to find the materials and support needed to learn about any topic, but you won't have those materials automatically. This book also won't give you the drive and dedication you need to start and continue your learning. You'll have to find those within yourself.

Learning something new can be scary, especially when you look around at other people's success stories. So often, people seem to be born with more: more natural intelligence, more opportunities, or more money. Is it possible to be as successful as people who were born with such advantages? And how much do early advantages affect success later in life? With these questions in mind, we'll begin chapter one.

Are you ready to learn how to learn?

Davan O'Donnell

Genes And Dreams

One in one thousand people are born naturally pitch-perfect. This is a genetic gift if there ever was one. These people can, from childhood, correctly identify any musical note that they hear on any instrument. Imagine the advantages they will have if they enter the field of music. When learning to sing or play an instrument, they learn faster and more accurately. And, until recently, perfect pitch was seen as something that you can only get through the lottery of birth.

In fact, this isn't quite true. In 2014, Ayako Sakakibara, a Japanese psychologist, assembled a group of 24 children between the ages of two and six^{*}. All the children followed a course created by Sakakibara that exposed them to fourteen major chords in short training

sessions, a few minutes at a time several times a day. The course continued for up to eighteen months, until the children could recognize each chord. Then, Sakakibara tested them to see if they had developed perfect pitch.

All twenty-four of the children had.

The odds of all 24 children being naturally pitch-perfect are extremely small. This brings us to a fascinating conclusion: perfect pitch, once thought to be a genetic gift that one either has or doesn't, is actually something that can be learned. Yes, it took these children up to eighteen months to learn perfect pitch, instead of being born with it. However, this can be an advantage, too. The process of learning a new skill develops perseverance and creativity that will be useful for many years to come.

It's tempting to think that talent is innate and unreachable, but even the best prodigies have adopted strategies to further their skills. By fitting yourself with the strategies for acquiring knowledge, skills, and attitudes, you can be destined for greatness just as much as someone born with a 'natural gift.'

Genetic Predispositions For Success

It is true that genetic factors can predispose you to success. Just like children can be born with perfect pitch, they can also be born with a trait referred to as mental toughness. Mental toughness reflects a person's natural ability to concentrate and to keep going when faced with obstacles. It has been shown to help people succeed in fields as diverse as business, sports, and education. It is a huge factor in learning new skills. And, perhaps most strikingly, 50% of variety in mental toughness can be explained genetically*. So, about half of your ability to concentrate and persevere in difficult situations is something you were born with. That's why some children can get good grades while hardly studying. It's also why some people recover from tough times more quickly and are less easily distracted.

This can be discouraging. After all, how can you compare with someone who has a genetic advantage? However, genetics only accounts for 50% of your mental toughness. The other 50% is developed over time. You can increase your mental toughness through training,

such as focusing on goal setting and self-reflection*. You can also become more mentally tough through looking at the world differently. If you can see problems as opportunities and believe in your power to control your life, you will become more mentally tough*.

Alongside self-training and perspective, the final factor in how mentally tough you are is environmental and often based on childhood. Positive childhood experiences, such as working together with a team and feeling successful, can increase mental toughness*. Looking back, if you remember positive experiences in some field or another while growing up, that speaks to your mental toughness today.

The story is the same with any genetic predisposition. Even if you are born mentally tough, pitch-perfect, or at a perfect height for a basketball player, you won't achieve your full potential without practice, training, and support. No success is based purely on genetics. Just look at Wolfgang Mozart. His father gave him and his sister musical training practically from infancy*. Without this, Mozart might well have become a mediocre painter who simply enjoyed listening to music in his free time. With that practice, he became the famous composer that we know today.

Similarly, many of today's great businessmen and women received start-up investments from wealthy parents. Many athletes and musicians had opportunities to hone their craft from childhood. All one-in-a-million success stories include a variety of factors. Genetics does play a role. So does practice. And so do elements beyond anyone's control, like family wealth and luck. Comparing yourself to prodigies and wild success stories is futile. They may have had very different life experiences or genetic predispositions that give them an advantage. Instead, focus on what you can control: learning and practice.

How can learning help you become successful? For an example, just look at Ray Allen. Allen is a ten-time All-Star in the National Basketball Association. He's also one of the world's best three-point shooters. Whether you know basketball or not, it's easy to see that he is very successful in his field. Journalists love to mention how skilled Allen is, even saying that he's a prodigy born with a natural gift for shooting baskets. He is tall, at 6 feet 5 inches,

which is a genetic predisposition for basketball greatness, but not enough to explain his professional success alone.

Allen's high school basketball coach disagrees with the idea that Allen is successful because of a natural gift*. Allen does, too. They agree that, back in high school, he was an average shooter, maybe even worse than his teammates. So, Allen's success was not because of genetics. It can't have been. Instead, his success came through hard work and constant practice.

Sometimes prodigies are born, but more often, they're made. Yes, there is a genetic component to success in any field. If Allen were five feet tall, he probably would never have become a successful basketball player. If Mozart had no interest in music, he likely would have fallen flat as a musician. And if you struggle with numbers and always have, you may never be a world-renowned mathematician. But you probably wouldn't want to be, anyway. Part of success is about practice and perseverance. Part of it is also about finding what you are good at and love doing.

The Neuroscience Of Learning And Practice

Learning can actually change your brain, even as an adult*. This change happens in three distinct places: your synapses, gray matter, and myelin. The last is the most interesting, because it is a process that you can maximize through a few simple steps to improve your learning. So, how exactly does learning change your neurochemistry?

Your brain is full of neurons, which are joined together by junctions called synapses. It is in these synapses that learning is thought to occur. Let's say you are learning to play the piano. The first time you play a simple song, it will be difficult. Your brain needs to work hard to fire the correct neurons for you to play the song. The information from your brain passes relatively slowly along your neurons, through your synapses, and to your fingers. The second time you play the song, it will still be difficult. By the tenth time, though, you will be able to play the song better and more quickly. And by the hundredth time, you'll be able to play the song almost completely on autopilot with little effort from your brain. That's

because, by the tenth or hundredth time, your neural pathways will be reinforced, with the synapses between the neurons growing stronger. This gives us the saying, "synapses that fire together, wire together." When you frequently use the same neural pathways to play the song, your neurons will work better together, allowing you to play easily and naturally.

Synapses can't remember a skill alone, though. Beyond strengthening your synapses, learning a new skill actually increases the gray matter in your brain. This physical change can be seen on an MRI, whether it's in musicians playing Chopsticks or university students studying for an exam*. Amazingly, these changes can happen after just a few hours of practice. This means that the more you practice something, the better your brain will become at learning and doing it. In a way, you're growing your own natural talent. At the same time, learning helps you develop myelin. This is particularly important because myelin growth is the learning process over which you have the most influence.

Myelin is simply a waxy substance that insulates your neurons. When it's present, your neurons fire faster, reducing the effort and time needed for information to flow along a given neural pathway*. Imagine traveling by car through a new city with only a paper map to guide you. The first time you cross the city, you may get stuck in traffic or take a long and circuitous route. Over time, though, you may find a less-crowded street that takes you right where you want to go. The myelin sheath on your neurons acts like this direct street. It lets information flow quickly past the neuron, reducing loss of information and streamlining the process.

So, what can you do to encourage the growth of myelin and improve your learning and retention? There are three simple steps to keep in mind: break your work into pieces, practice it, and learn to feel it. These three steps, identified by Daniel Coyle, are known as deep practice*.

Let's go back to learning to play a song on the piano. In your second week of learning, your music book covers how to play Chopsticks. You read the section and play the song slowly once or twice. At this point, it's tempting to close the book and move on. After all, you know how the song should be played now.

However, without practice, your brain hasn't had an opportunity to reinforce your new knowledge with increased myelin. That means that when you try to play the song next time, you'll likely struggle as you try to remember the correct notes. And, if you play a wrong note, you might not even notice. Instead, use deep practice to build myelin sheaths and your own understanding.

First, listen to a recording, preferably with a video, of an established pianist playing Chopsticks. Listen several times until you start to get a feel for the song. Then break it down into smaller pieces. This can be as simple as different sections of the song. Breaking it into steps will tell you what you need to learn and what specific pathways will need to be strengthened.

Next, use repetition. Practice playing the song, three or four times a day, for a few days. Use your book or recording the first few times, to make sure you're playing it correctly. This will allow myelin to form and your playing of the song to become as natural as if you'd been doing it your whole life. The more you repeat the song, the stronger your neural pathways will become. It's also important not to simply play the song over and over in one session, but instead to space it out over several days or longer. This will teach your brain that the song is important and something you'll need again and again.

Finally, learn to feel it. With time, you'll be able to hear when you play a note incorrectly or when your tempo or rhythm is off. You may not know yet how to fix it, but that's alright. Simply recognizing the mistake and going back to your music book or recording is enough to reinforce the correct pathway, instead of creating a new, incorrect one. Once you can 'feel' the song, you'll be relying on your existing myelinated pathways.

It is also important to take care of yourself beyond your learning, such as getting regular exercise and enough sleep. Both of these factors will help your body create and reinforce neural pathways over time.

Going back to our basketball player, Ray Allen, we can see how his excellent three-point shot was developed, instead of being something he was born with. Allen recognized

something he needed to learn, how to play better. He broke it down into a specific skill, shooting a three-pointer. Then he practiced again and again, strengthening his neural pathways and growing myelin, until the shot was second nature.

Specializing Young Isn't A Recipe For Success

Ray Allen had an advantage because he was willing to practice again and again until he achieved his goal. He may have had another advantage too, which was that he wasn't a child prodigy at basketball. This may sound counterintuitive. After all, so many of the world's famous success stories talk about people who are really good at something as children and go on to be great at it as adults. Mozart is an example of this: he was already a great musician as a child and continued to improve as he grew up. Simone Biles and other Olympic gymnasts often fall into the same category.

However, this kind of path is actually rarer than it may seem. The specialty that you may have as a child, or your obligatory specialty that you were pushed into for whatever reason, is probably not the same thing that you're good at as an adult. Child prodigies often lose interest in their specialty at a very young age. The same thing happens to most children. Just think of your own background. Are you still as passionate today as you were growing up about space or princesses or football?

Beyond simply being rare, specializing early can actually have a negative impact. That's because specializing early eliminates years of exploration and accumulation of general knowledge. In today's interconnected world, that can be a huge problem. Imagine, for instance, a very specialized chemist who is hired to design a nationwide science curriculum for public schools. The chemist is the foremost expert in his field, so he should absolutely know what needs to be included. However, without experience in various fields, the curriculum he creates may be difficult to understand. That's because he may not be able to explain chemistry to someone without his background. It may not include the correct general knowledge topics, instead focusing too much on the chemists' own specialty. Or it may simply take too long to create, as he struggles to know what should be included for a broad audience.

Now, imagine a chemist who has also worked as a teacher and in a multinational business. This chemist will know what students will need to learn about chemistry. He'll know how to explain difficult topics to people with very different backgrounds. And, of course, he'll know all the necessary science. The chemist might not have enjoyed the previous jobs, but they all have given him extremely valuable skills. That's because he engaged in a sampling period.

So, what is a sampling period exactly and what are the benefits? A sampling period is just what it sounds like: a time in which you engage in a variety of different activities, jobs, and experiences*. Many of us do this as children, spending our time outside school trying different sports, after-school clubs, and hobbies. As adults, many of us continue sampling, working at various jobs, developing our hobbies or starting new ones, continuing our education.

It's common to look back on your life and feel some regret, especially if you took a roundabout path to get to where you are now. If only you'd started playing guitar younger. If only you'd never given up on Italian. If only you had majored in a different subject in college. In reality, though, all these experiences were beneficial because they were part of your sampling period. Even a short period spent learning a new skill helps you become more creative and better at learning. Even jobs that aren't relevant to what you do now or weren't interesting taught you something. That might have been a specific skill or simply the ability to know when to leave a bad situation. Because of all this, people who engaged in a sampling period are more creative, more able to transfer their skills to a new situation, and better at learning*.

Some people know what they want to do when they are young and get better and better at it throughout their lives. For most of us, though, we take a more circuitous route, trying a variety of different paths before we settle on the one that's best for us. This sampling period allows for a broader and more applicable understanding of our chosen fields.

My grandmother is a shining example that there is more than one way to succeed. She began her career working in a laundromat near the beach. In her early twenties, she started

over as a labor and delivery nurse. She will tell anyone that she is not particularly academically gifted. Nursing school was a challenge, but she studied hard and got through it, coming out in the middle of her class.

After spending nearly her whole career as a nurse, working in different cities and countries in a variety of situations, she started over again in her mid-fifties. She decided to work in a growing field that was always short of professionals: computers. It was an almost insane choice when most of her peers were struggling with anything technological, but my grandmother drew on her long history of adaptation and learned quickly. The last years of her career were spent teaching others, often many years her junior, how to use a medical computer system, as well as maintaining and rolling out that system. Even now, her grandchildren call for computer tips. Without all the time she spent doing completely unrelated work that taught her how to think and learn, she never would have become so successful in computers. Her success is thanks to her sampling period.

The best thing about my grandmother's story is that it isn't unusual or unique. You don't have to look far to find examples of people who became great at something later in life, who struggled before finding something they loved, and who persevered despite not having a natural gift. Stories about prodigies tend to catch on quickly and become popular. Think of Tiger Woods playing golf from childhood, Mozart and his perfect pitch, and Simone Biles and her gymnastics achievements at a young age.

These stories don't describe most people, though. There are hundreds of stories of people who worked hard, struggled, and took a lot of detours on their way to greatness. This list includes amazing achievers like Ray Allen, Roger Federer, Jeff Bezos, and my grandmother. There are a lot of ways to succeed. You just need to find the one that works best for you.

Action Steps

You know that there are many ways to greatness, and that both practice and finding what you love are important. Now it's time to take that theory and make it practical. So, right now,

take a piece of paper and start listing your capital. Your capital is simply the advantages and skills you already have, spread out across a variety of fields.

Begin with the human talents you might have. Do you have perfect pitch? Have you always been a good writer? Can you make conversation with anyone? Are you focused and determined? These are the skills that you might have already spent years developing, or the talents that you seem to have been born with.

Next, think of your social capital. Do you have friends or family who already know the skill you want to learn? Do you have colleagues who always push you to work harder? How about a supportive friend who can help keep you motivated? Your social capital can help you achieve your goals, either directly through teaching or indirectly through support.

Once you've considered this, move on to your economic capital. This doesn't have to mean that you have a million dollars in the bank or a huge salary. It can simply be that you have enough resources to buy materials to help you learn. Or your financial resources might be more skill-based, such as a good sense for budgeting or investment knowledge. Economic capital, although not essential, can help you invest in your learning.

Most important, list your experiential capital. Maybe you worked in a restaurant as a teenager, which taught you the value of hard work and self-motivation. Maybe you worked in multiple fields over time, so you are able to apply your skills in a variety of situations. Or maybe you have years of experience in your chosen field already, along with the wealth of knowledge that comes with it. Outside of work, make sure to include your hobbies and life experiences, such as life-changing trips, ground-breaking conversations, or simple principles that you have learned to live by. This experiential capital will likely illustrate your sampling period.

As you write your list, keep in mind specific skills that you are interested in learning and how you might be able to apply your existing capital. Even if you feel at first like you have no background in a topic, you still have capital to draw on. Maybe it comes from a different

field or has more to do with your personality than a specific skill. For instance, from our piano example, your list might look a little like this:

- Love of music, especially classic music
- Patient and dedicated
- Colleague who already plays the piano
- Keyboard at home
- Money for music books
- Six months of guitar lessons in college
- Attended lots of classic concerts, so familiar with the style

If you are interested in more than one skill, write more than one list. You might be surprised to see how much of the same capital comes up across both. Then, take some time with your list. Look at it again tomorrow. It's likely that you'll think of a few more things to add.

Once your list is complete, start thinking about how you can maintain and maximize your capital. You already love classical music, so can you listen to a few piano pieces on your way to work each day? You have a colleague who plays the piano, so can you ask for a few tips for getting started? How about your experience with the guitar? Can you think back to how you learned then and use some of the same strategies now? Can you compare the musical notes and scales you learned on guitar to the same notes on the piano? Write your strategies next to each piece of capital on your list.

You already have significant advantages. These may be obvious advantages, from perfect pitch to family wealth. They may also be less obvious, such as a simple appreciation for the topic or unrelated learning experiences that you can find a way to apply. Whichever way it is for you, take the time to write out your list and your strategies. Your capital, big or small, matters. It's going to make all the difference.

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