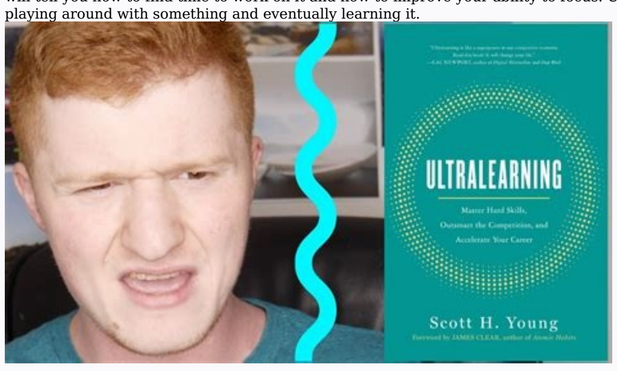


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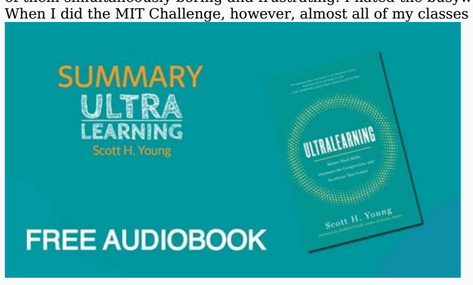
Ultralearning is deep self-education to learn hard things in less time. I've written before about how I've used this approach to learn MIT computer science, multiple languages and cognitive science. I've touched on some of the aspects of ultralearning in previous articles. It focuses on learning depth-first, breaking impasses down into prerequisites you can finish step-by-step, creatively using resources and balancing theory with practice. In this article, I want to show you how to start your own ultralearning project. To make things easier, I've split this article into two parts: the first part, explaining why you should start an ultralearning project and how to design it. The second part, available here, will tell you how to find time to work on it and how to improve your ability to focus. Ultralearning projects are hard work. Not only do they require you to take time out of your life, but they're also mentally demanding. Given this, a good question to ask might be, why bother ultralearning at all? The opposite of ultralearning is dabbling. This means playing around with something and eventually learning it.



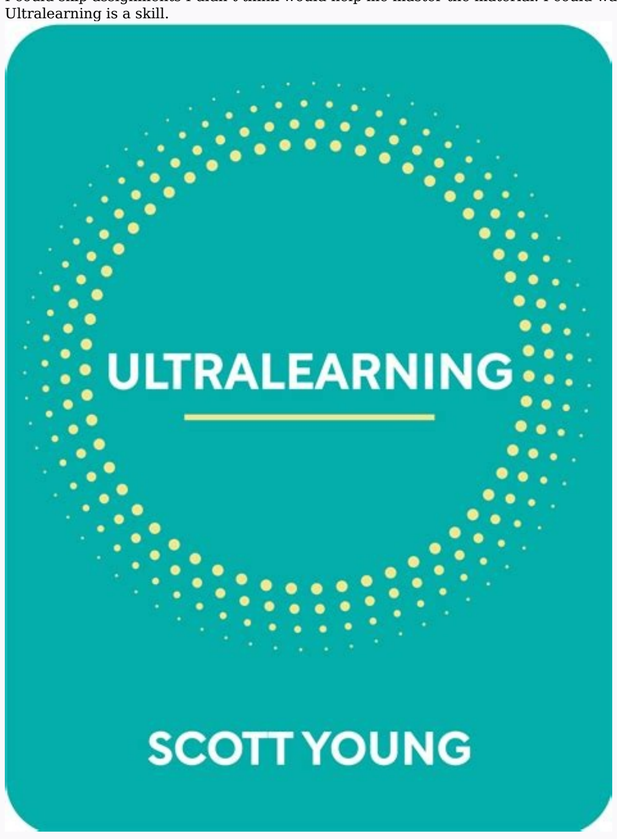
There's no commitment. No time put aside. And if it becomes too mentally difficult or boring, you stop. There's nothing wrong with dabbling, and often it's by dabbling that I first explore whether I'd like to learn something through an ultralearning project.
However, despite the investment of time and energy, ultralearning projects can help you achieve breakthroughs in whatever you're trying to learn.
Ultralearning projects are hard. But the trade-off is that intense focus enables rapid learning progress. Eliminating distractions, learning the hardest parts first, driving at your weaknesses and investing concrete chunks of time all enable you to take a learning endeavor that you might normally imagine learning over a few years and compress it into a few months.
My language learning project was a good example of this. Yes—the No-English Rule and intensive study did require a lot of effort. But the advantage was that I reached a level in three months that often takes a year or two of more typical study. Many learning opportunities become more interesting when you get better at them. Languages are much more fun when you can actually hold conversations. Work skills are more useful when they actually help your career. Drawing, sports and music are all more fun when you're good at them.



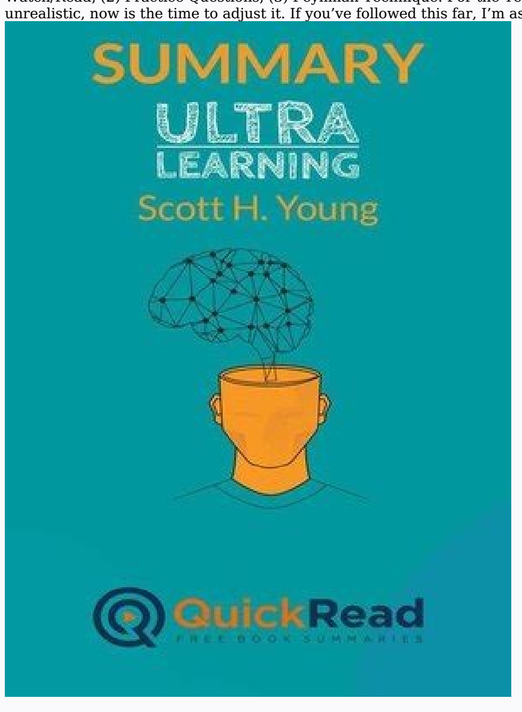
Ultralearning can allow you to push faster through the frustrating parts and get more quickly to a level where continuing mastery is enjoyable and fun. When I told someone I was about to take on the MIT Challenge, they said, "You must really love studying." But the truth was, I didn't actually enjoy most of the classes I had in university. I found many of them simultaneously boring and frustrating. I hated the busywork, the group projects, the classes where the professor didn't say anything useful and I had to struggle to stay awake. Traditional learning involves long stretches of boredom peppered with random frustration.
When I did the MIT Challenge, however, almost all of my classes were interesting. I think the reason was that self-education is results-driven. It doesn't matter which resources you use, as long as you get to the point.



I could skip assignments I didn't think would help me master the material. I could watch lectures faster if they were boring, rewatch them if I was confused. Optimizing for faster learning, in turn, also optimized for being completely engaged with learning. Ultralearning is more interesting because everything you do feels like it actually matters.
Ultralearning is a skill.



Once you've mastered the process you can repeat it again and again on anything you want to learn. It's also a skill that's becoming increasingly valuable. The economy is hollowing out the middle. Workers are expected to adapt faster and faster to new ways of doing things. The best in the profession are earning ever more than the average. Flexible, rapid learners have a golden opportunity, while those who struggle to keep up are going to find it harder and harder to survive. Practicing on ultralearning projects gives you an edge like almost nothing else will in skilled professions. Designing your own ultralearning project has three parts: Figuring out what you want to learn deeply, intensely and quickly. Choosing which format you want for your project. Preparing to start learning. What would you like to learn? It could be a subject—say you want to quickly learn a lot of history, business or math. It could be a career skill—you want to master Excel or JQuery.
It could be something you've always wanted to learn for fun—guitar, French or painting. What you want to learn doesn't matter and I can't choose it for you. But I can suggest a couple things to keep in mind when picking the subject: Only pick one thing. Ultralearning projects need specificity. Saying you want to learn guitar, French AND cooking is a recipe for a mess of a project. Instead pick one thing and save the other things you want to learn for a later project. Shorter projects need more constraints. The smaller your project is, the more it needs to focus on something specific to make progress noticeable. If you're only going to spend a month, one-hour a day, then don't make your project "learn programming" or "learn Chinese". Instead make it more focused: "learn to make text-only games in Python" or "learn pinyin and master set phrases in Mandarin." Avoid overly specific goals and deadlines. For first-time ultralearners, I don't recommend setting a particular goal and deadline, like I did with the MIT Challenge. The reason is that once you start learning, you'll quickly realize whether your goal is realistic, too easy or too hard. If it's too easy, you won't focus. Too hard, you'll probably give up. That means you have a fairly narrow range to shoot in order to be successful.
A better approach is to pick the direction you want to learn and choose a target when you're about one-third to halfway done the project. So a good approach might be that you'll learn the MIT computer science curriculum, but once you start you can decide how far it is realistic for you to get in the time you have. There's a lot of different ways to do an ultralearning project. Which you use will depend heavily on your schedule and the importance of the challenge to you. Here's three different styles for an ultralearning project: Full-time projects. These are the most intense, most costly and fastest projects. The advantage of a full-time or nearly full-time project is that you can really get learning done in incredibly short time periods. Good if you're between jobs, classes or otherwise can devote yourself to the project. Fixed-schedule projects. These are projects which have concrete hours you'll devote to them every week. One example could be spending an hour each day before work, two hours before bed, or two 5-hour bursts on the weekend. The amount of time isn't too important (although less weekly investment = slower progress) but I wouldn't recommend putting in chunks of time less than 30 minutes. Fracturing the time over too many spots in the day doesn't enable the focus required. Fixed-hour projects. These projects don't have a particular schedule, but they do have a number of hours (3, 5, 20) that you'll put in each week wherever you can find time in your schedule. This is the hardest type of project to successfully execute, but it may be the only feasible way to do ultralearning for some people. In general, I recommend an ultralearning project be your principle goal during the period you're doing it.
It's okay to keep working on other things and maintain habits. But ultralearning projects don't work well if they're just one of many things you're simultaneously trying to achieve. Once you've picked a format, you need to select a length of time. In general, if your weekly time investment is low, you'll need either a long project or a more severely reduced scope. If I wanted to learn programming, but was only putting in 3 hours per week for ultralearning, I would either need a long time horizon (say 6-12 months) or reduced scope (a particular language, type of program, etc.) I actually don't recommend starting right away when you have an ultralearning project. The reason is that the intensity of learning can make it very easy to quit if you haven't planned it properly. A good ultralearning project starts with some amount of time in preparation. This allows you to gather material, research different learning strategies for your particular skill or subject, plan out your time and conduct a pilot test of the schedule. My rule of thumb is that preparation should be no less than 50% of the length of the project itself with full-time hours. So when I did the MIT Challenge (a full-time project over one year) I would want six months minimum of low-intensity preparation. If you're doing five hours per week over 8 weeks, I would want to spend at least a week doing preparation. Here's what you need to do in that preparation time: Research how learning works best for that particular domain. Hunt around for all the possible learning methods, strategies and recommendations. Note common themes and complaints people make. Note also alternative strategies that differ. This should give you a good idea of how you want to learn, as well as backup options in case your first approach fails you. Gather material and design a preliminary attack plan. Order books online if you need them. Sign up for online courses. Get tools, material and equipment if you need any. Then create a simple plan for approaching them to learn. This doesn't need to be complicated. For the MIT Challenge it was: (1) Watch/Read, (2) Practice Questions, (3) Feynman Technique. For the Year Without English it was: (1) No-English Rule, (2) Tutoring, (3) Book Study. Conduct a pilot week of the schedule. Before you fully commit to starting the project, test it out. See how it fits into your life and get a sense of how difficult it will be. If it is too hard, or your schedule is unrealistic, now is the time to adjust it. If you've followed this far, I'm assuming you're at least somewhat interested in starting your own ultralearning project.



So why not just do it? Write in the comments here below what ultralearning project you want to tackle: what you want to learn and the format you're going to use to pursue it. In response, I'll try to reply to as many people as possible offering advice on how to make their ultralearning projects a success! (continued)... 2. Create constraints. Constraints force you to move outside your comfort zone to learn in new ways, and this enhances your proficiency. For example, if you've reached proficiency in a new language by practicing with a bilingual tutor, add the constraint of practicing with speakers who don't speak your native language. (Shortform note: Research shows that constraints force you to be more innovative and focused. There are different ways you can impose constraints, such as giving yourself tight deadlines and restricting your resources.) 3. Diversify your skills. Young recommends selecting an additional skill to practice that is seemingly unrelated to a skill you've already become proficient in.
Proficiency in both skills can give you a competitive advantage. For example, if you're a nurse, you might take up painting, creating a niche for yourself that intersects health with the arts. (Shortform note: Aside from giving you a competitive advantage, learning an unrelated skill can stoke your creativity and lead to new ideas and unique connections. In Think Like a Rocket Scientist, Ozan Varol writes that Albert Einstein used this method, called "combinatory play," by combining his knowledge of science with his interest in music to yield new insights into both fields.) Principle 4: Address Your Weak Points Young's fourth principle of ultralearning is to isolate a weakness in your learning process and concentrate intensively on it, or what he calls "drilling." The aspect you isolate will be an integral component of the overall skill or subject, and in mastering it, you unblock areas of learning that are impeding progress. By addressing the most difficult aspects of the process, you reduce delays, learn to confront your weaknesses, and improve overall proficiency. For example, if you want to be a successful YouTuber, you might have developed your video-editing skills. However, if you haven't learned how to speak in front of a camera in a natural, engaging way, you still might not be able to attract subscribers.
Thus, your speaking ability is impeding your progress, so you should focus your learning efforts on improving that particular skill. Young advises using the previous principle—practice experientially—in tandem with this principle of focusing on a specific aspect of a skill you're learning. First, practice your skill in the context you want to apply it in; then, identify your weak links and concentrate on improving those; finally, practice again, integrating the improvements you've made. How to Isolate Your Weak Points Young writes that it's important to address any bottlenecks in your learning process, but he doesn't give specific tips for isolating these weak spots. To this end, it might help to view your learning process as a system based on Donatella Meadows's tips in Thinking in Systems: Make a diagram of your learning process. Doing this allows you to see how each area of the skill you're learning connects with one another. Having a visual cue makes it easier for you to spot areas that could be causing blocks, impeding your progress in connected areas.
Get feedback from reliable sources. Show your illustrated process to credible people (such as others who've mastered the skill you're trying to learn) and ask them for their input. They may be able to see barriers that you aren't seeing.
Make adjustments based on what you've learned. Similar to Young's method of practicing, addressing a weakness, then practicing again, you should incorporate any helpful feedback you receive. This might mean realigning your process with your learning goals or adding a missing component. Once you've made the necessary changes, practice your skill again. Principles 5 and 7: Strengthen Your Memory Young discusses techniques for enhancing your memory in two different principles (his principles 5 and 7), which we'll discuss together here. To improve your memory, particularly your long-term memory, he recommends self-testing, excessive studying, and spacing out your learning periods. (Shortform note: While Young asserts that retaining information is a crucial element of ultralearning, research suggests that forgetting may be just as important for healthy brain function. Scientists theorize that the ability to forget clears your brain of clutter, which helps you process new information more effectively.) Young writes that, when learning new information, you should go beyond just reading or listening to a lecture and instead use self-testing: Ask yourself questions to recall the information you learned, through tactics like flashcards or free recall (writing down everything you can remember from what you just studied). The process of forcing your brain to retrieve information on its own, without the source material, helps you commit the information to memory. (Shortform note: Research suggests that self-testing is more effective than other methods such as rereading material and concept mapping because the testing process clarifies what you know and don't know—when you can't recall an answer to a question, it's a clear indication that you haven't committed the information to memory yet and should thus fill that gap in your knowledge.) When testing yourself, Young writes that it might be more beneficial to give yourself time between study and active recall. He cites research suggesting that this small delay makes it more difficult to recall information, giving you a mental challenge that effectively improves learning. (Shortform note: One way to give yourself time between study and active recall: Take a nap. This not only gives you a small delay, as Young recommends, but it may also help you remember more. Matthew Walker explains this phenomenon in Why We Sleep: During sleep the brain moves facts from your hippocampus—your short-term memory bank—to the cortex, which stores long-term memories, enabling you to retain information.) Study Excessively Research shows that overlearning something even by just a small amount results in 1-2 weeks of further recall.
Young says you can overlearn by selecting a simple learning task (for example, changing a tire), practicing the task until you're able to do it correctly once, then practicing it multiple times after that. (Shortform note: Overlearning is a well-acknowledged tactic in the field of psychology, but it does have its downsides. In Atomic Habits, James Clear writes that overlearned behavior can turn into mindless actions, which can then lead to stagnation—when you do something without thinking, you may no longer think about how to improve your performance. To keep improving, he suggests finding ways to increase the degree of difficulty of the task as you repeat it.

For example, once you've mastered changing a tire, try making it more challenging by changing it in various scenarios, such as in the rain or at night.) Allow Significant Time Gaps Between Learning Periods Young recommends spaced repetition—multiple learning periods spread out over time—because taking a break before revisiting what you've learned better supports long-term memory retention. (For example, if you want to learn how to play a song on a guitar, it's better to devote an hour to the task every couple of days than to learn the whole song in one go.) Once you've reached proficiency and no longer have to practice intensively, Young recommends practicing semi-regularly to refresh your memory. (Shortform note: Young suggests that through his techniques of ultralearning, you can master new skills in a short period of time. However, some argue that achieving mastery with spaced repetition like he recommends here requires the same amount of time and effort as it would with traditional schooling.
In short, there may not be any shortcuts to sustained mastery.) Principle 6: Pursue and Filter Feedback Young's sixth principle of ultralearning is to aggressively pursue feedback and then filter it to take in what's most useful. Feedback builds on the previous principle of self-testing: While testing yourself is a highly effective way to learn new information, feedback gives you the opportunity to find out if what you've learned—and how you're applying it—is correct.
Young says you should seek out feedback by putting yourself in real-world situations where others will tell you what you need to work on. For example, if you're learning how to write fiction, you might submit your work to an online writing community for critiquing. How to Be More Receptive to Feedback While Young writes that feedback allows you to correct what you're doing wrong, he doesn't discuss the fact that many people avoid feedback because it can be uncomfortable to hear. In Principles, Ray Dalio writes that this discomfort comes from your ego or your underlying desire to be seen as capable; experiences that threaten your ego, such as receiving feedback that points out your weaknesses, can cause you pain. To become more receptive to feedback, Dalio writes that you should change your mindset. Be happy instead of ashamed when someone points out your errors because it gives you an opportunity to get better. Learn to bear and reflect on the pain that comes from other people's comments, and use it to move forward.
Young writes that the least valuable type of feedback is feedback that appeals to your ego—praise can make you feel good but it may not be a constructive assessment of your skills.
On the other hand, negative feedback can feel discouraging and impede learning. The most valuable type of feedback is corrective feedback, which tells you what you're doing wrong and how to fix it. How to Ask for Corrective Feedback Young doesn't give specific tips for asking for corrective feedback. To get specific, actionable comments instead of vague feedback, Jack Canfield recommends asking two questions in The Success Principles: 1) In what ways do you see me holding myself back? Canfield says that people who know you well can help expose your blind spots, pointing out habits or behaviors that may be holding you back from progress. You can also consult people who've mastered the skill you're learning, because they'll likely have a better sense of the areas you need to work on. 2) On a scale of one to 10, how would you rate (BLANK)? Ask others to evaluate different aspects of the skill you're working on. For example, if you're aiming to become a good public speaker, ask a practice audience to rate you on your voice, pace, and body language. Principle 7: Seek a Deep Understanding of Ideas The seventh principle of ultralearning is to seek a deep, detailed understanding of ideas and principles (what Young calls "intuition"). Young asserts that having a deep knowledge gives you a solid foundation. This enables you to build on that knowledge so that you're able to understand more complex ideas related to your target skill, ultimately leading to true mastery. For example, you must have a deep understanding of algebra before you can master calculus. (Shortform note: Having this deep knowledge can be likened to "principles-first thinking," which Ozan Varol describes in Think Like a Rocket Scientist. Aside from being able to perform a skill more proficiently, he writes that having a thorough understanding of the fundamental components of a topic can lead to more creative thinking. This is because you're able to pare down to the core concepts and build new connections from there.) Young writes that there are three rules to developing deeper knowledge: 1. Let yourself struggle. Young says you should exert effort to face the difficulties that come with mastering a skill, instead of shying away from them. (For example, instead of skipping an algebraic equation that you find challenging, keep working on problems until you understand the concept.) This deliberate struggle leads to a deeper understanding of ideas and concepts. Young says you can encourage this by setting a timer for 10-15 minutes and pushing yourself to work on a difficult problem at least until the timer goes off. (Shortform note: Getting stuck on a problem can be discouraging, so Ryan Holiday recommends breaking down intimidating problems into more manageable steps. In The Obstacle Is the Way, he writes that you should focus on what you have to do now, going step by step, instead of thinking about the end goal.) 2.
Challenge your understanding. Young says that when you think you understand something more than you actually do, you keep yourself from learning. You should frequently question yourself to avoid the cognitive bias which leads you to overestimate your knowledge. Always ask, "Do I understand this well enough to explain how it works?" (Shortform note: To check if you understand something correctly, Ray Dalio suggests that you seek out smart people and listen to what they have to say.
In Principles, he writes that you should recognize that you have blind spots and should thus be open-minded enough to accept the possibility that others might know something better than you do.) 3. Use concrete examples. The human brain understands abstract information better when it's connected to concrete examples. Additionally, when you personalize those concrete examples, you retain information at a deeper level. (Shortform note: Barbara Oakley and Terrence Sejnowski explain why using personalized concrete examples can help you gain a deeper understanding of a subject. In Learning How to Learn, they explain that thoughts are based on neural connections, and new information becomes easier to retrieve when it's connected to existing information stored in your brain—like familiar, concrete situations or personal details about your life.) Putting It Into Practice: Create an Ultralearning Project Now that you've explored Young's principles of ultralearning, you're ready to create your first ultralearning project.
Young outlines five steps. Step #1: Research How to Learn the Material Conduct research on the best way to learn the material. By the time research concludes, Young says you should know what you want to learn and why, the materials you'll need, your learning benchmarks based on what others have done before, and ways you'll practice what you've learned. How to Choose a Skill to Learn If you're having a difficult time deciding what to learn—particularly if your goal is to get ahead in your career—experts recommend asking yourself three questions: What skills can help my organization? Identify the areas that have an impact on your company's growth and figure out what you can do to contribute to those areas. For example, if your company's social media presence is underutilized, you can learn social media management. What am I good at? Compare the list of areas that you've identified with your strengths. Look for overlaps and narrow your choices down to those skills. What do I want to learn?
Determine which skill gets you excited or which will give you the greatest personal benefit. Step #2: Create Your Schedule Think about the amount of time you're willing to devote to the project, and plan accordingly. A schedule can help you manage your pace so you don't feel pressure to learn too quickly or frustrated with scheduling conflicts down the line. (Shortform note: To carve out time for learning when you already have a packed schedule, consider Stephen Covey's tip in First Things First.
Classify all of your tasks into four zones: significant and pressing, significant but not pressing, pressing but not significant, and neither significant nor pressing. Prioritize the tasks that are significant but not pressing—such as learning—because these are the ones that help you reach your goals. Then, limit the time you spend on other tasks that aren't significant.) Step #3: Start Learning Review the key points of each ultralearning principle and determine whether you've maximized your use of it. With metalearning, for example, you might ask: "Have I completed enough research to determine the best ways to learn this skill or topic? Is there anyone I can get new insights from?" Make modifications wherever necessary and possible. (Shortform note: At this point, experts recommend considering whether you've chosen the optimal learning style. You may have mapped out a learning plan based on your perceived abilities—for example, your primary method of learning might be to listen to lectures because you're an auditory learner. However, the authors of Make It Stick argue that it's more important to match the style of instruction to the subject of the lesson, rather than your preferences.) Step #4: Analyze Your Progress After you complete your project, Young says you should identify areas of success as well as areas that need improvement.
For successful projects, repeat the things that worked, and for weak projects, identify where and how to improve. (Shortform note: The authors of Make It Stick caution that evaluating your own performance can inhibit your progress because people are generally poor judges of their own abilities. To get a more accurate view of your progress, you should learn alongside others—whether they're seasoned veterans, fellow professionals, or students learning the same skill.) Step #5: Create a Plan for Long-Term Retention Much of what we learn decays with time, so determine your plan of action for remembering information right after you reach the learning goal. To help you retain what you've learned, Young recommends finding a way to incorporate it into your day-to-day life, taking a class to refresh your memory, or immediately beginning a new learning project that supplements your original learning goals. (Shortform note: Another way to retain what you've learned is to teach it to another person. One study shows that students who taught others what they learned remembered more than those who didn't teach the material.)