- “In theory, there is no difference between theory and practice. But in practice, there is.”*

- Principle #1: Metalearning—I started by examining other popular bloggers and authors. Their methods helped me to create a map for what I needed to do to become a successful writer. Principle #2: Focus—I went full-time as a writer nearly from the start. Aside from a few freelance projects I took on to pay the bills, the vast majority of my time was spent reading and writing. Principle #3: Directness—I learned writing by writing. I set a schedule for myself to write a new article every Monday and Thursday. Over the first two years, I produced more than 150 essays. Principle #4: Drill—I systematically broke down each aspect of writing articles—the headline, the introductory sentence, the transitions, the storytelling, and more—and put together spreadsheets filled with examples of each segment. Then I set about testing and refining my ability to perform each small aspect of the larger task. Principle #6: Feedback—I personally emailed nearly all of my first ten thousand subscribers to say hello and to ask for feedback on my writing. It didn’t scale, but it taught me a lot in the beginning.

- Spaced-repetition software is an advanced flash card algorithm first developed by the Polish researcher Piotr Woźniak in the 1980s.4 Woźniak’s algorithm was designed to optimally time when you need to review material in order to remember

- Barone estimates that within the first year of its release, Stardew Valley had sold well over 3 million copies. In months, he went from an unknown designer earning minimum wage to a millionaire named one of Forbes’ “30 Under 30” stars within game development.

- Steve Pavlina is an ultralearner. By optimizing his university schedule, he took a triple course load and completed a computer science degree in three semesters.

- Diana Jaunzeikare embarked on an ultralearning project to replicate a PhD in computational linguistics.9 Benchmarking Carnegie Mellon University’s doctoral program, she wanted to not only take classes but also conduct original research. Her project had started because going back to academia to get a real doctorate would have meant leaving the job she loved at Google.

- Trent Fowler, starting in early 2016, embarked on a yearlong effort to become proficient in engineering and mathematics.11 He titled it the STEMpunk Project, a play on the STEM fields of science, technology, engineering, and mathematics he wanted to cover and the retrofuturistic steampunk aesthetic. Fowler split his project into modules. Each module covered a particular topic, including computation, robotics, artificial intelligence, and engineering, but was driven by hands-on projects instead of copying formal classes.

- The ultralearners I met were often unaware of one another. In writing this book, I wanted to bring together the common principles I observed in their unique projects and in my own. I wanted to strip away all the superficial differences and strange idiosyncrasies and see what learning advice remains. I also wanted to generalize from their extreme examples something an ordinary student or professional can find useful.

- easy things; they come from realizing your potential and overcoming your own limiting beliefs about yourself. Ultralearning offers a path to master those things that will bring you deep satisfaction and self-confidence.

- In the words of the economist Tyler Cowen, “Average is over.”1 In his book of the same title, Cowen argues that because of increased computerization, automation, outsourcing, and regionalization, we are increasingly living in a world in which the top performers do a lot better than the rest.

- Driving this effect is what is known as “skill polarization.” It’s well known that income inequality has been increasing in the United States over the last several decades. However, this description ignores a more subtle picture. The MIT economist David Autor has shown that instead of inequality rising across the board, there are actually two different effects: inequality rising at the top and lowering at the bottom.2 This matches Cowen’s thesis of average being over, with the middle part of the income spectrum being compressed into the bottom and stretched out at the top.

- Lower-skilled jobs, which often require face-to-face contact or social knowledge in the form of cultural or language abilities, are likely to remain. Higher-skilled work is also more resistant to shipping overseas because of the benefits of coordination with management and the market. Think of Apple’s tagline on all of its iPhones: “Designed in California. Made in China.”

- This paints a picture that might either be bleak or hopeful, depending on your response to it. Bleak, because it means that many of the assumptions embedded in our culture about what is necessary to live a successful, middle-class lifestyle are quickly eroding. With the disappearance of medium-skilled jobs, it’s not enough to get a basic education and work hard every day in order to succeed. Instead, you need to move into the higher-skilled category, where learning is constant, or you’ll be pushed into the lower-skilled category at the bottom. Underneath this unsettling picture, however, there is also hope. Because if you can master the personal tools to learn new skills quickly and effectively, you can compete more successfully in this new environment. That the economic landscape is changing may not be a choice any of us has control over, but we can engineer our response to it by aggressively learning the hard skills we need to thrive.

- Education: Tuition Is Too High

- The trends toward skill polarization in the economy, skyrocketing tuition, and new technology are all global. But what does ultralearning actually look like for an individual? I believe there are three main cases in which this strategy for quickly acquiring hard skills can apply: accelerating the career you have, transitioning to a new career, and cultivating a hidden advantage in a competitive world. To

- Ultralearning is a potent skill for dealing with a changing world. The ability to learn hard things quickly is going to become increasingly valuable, and thus it is worth developing to whatever extent you can, even if it requires some investment first.

- The best ultralearners are those who blend the practical reasons for learning a skill with an inspiration that comes from something that excites them.

- My feeling after my MIT Challenge wasn’t just a deepened interest in math and computer science but an expansion in possibility: If I could do this, what else could I do that I was hesitant to try before?

- The core of the ultralearning strategy is intensity and a willingness to prioritize effectiveness.

- The director taught de Montebello to give his speech dozens of times in different styles—angry, monotone, screaming, even as a rap—then go back and see what was different from his normal voice. According to de Montebello, that helped break him of the “uncanny valley” that happened when his normal speaking delivery felt slightly unnatural.

- Another friend with a background in theater gave him tips on stage presence. He took de Montebello through his speech and showed how each word and sentence indicated movement that could be translated to where he moved on the stage.

- “Make me care,” Gendler told him after listening to one of de Montebello’s speeches. “I understand why this is important to you, but the audience doesn’t care about you. You have to make me care.”

- What differentiated de Montebello wasn’t that he thought he could go from near-zero experience to the finalist for the World Championship in six months. Rather, it was his obsessive work ethic. His goal wasn’t to reach some predetermined extreme but to see how far he could go. Sometimes you’ll get lucky and embark on a path that will take you quite far.

- There are nine universal principles that underlie the ultralearning projects described so far. Each embodies a particular aspect of successful learning, and I describe how ultralearners maximize the effectiveness of the principle through the choices they make in their projects. They are: Metalearning: First Draw a Map. Start by learning how to learn the subject or skill you want to tackle. Discover how to do good research and how to draw on your past competencies to learn new skills more easily. Focus: Sharpen Your Knife. Cultivate the ability to concentrate. Carve out chunks of time when you can focus on learning, and make it easy to just do it. Directness: Go Straight Ahead. Learn by doing the thing you want to become good at. Don’t trade it off for other tasks, just because those are more convenient or comfortable. Drill: Attack Your Weakest Point. Be ruthless in improving your weakest points. Break down complex skills into small parts; then master those parts and build them back together again. Retrieval: Test to Learn. Testing isn’t simply a way of assessing knowledge but a way of creating it. Test yourself before you feel confident, and push yourself to actively recall information rather than passively review it. Feedback: Don’t Dodge the Punches. Feedback is harsh and uncomfortable. Know how to use it without letting your ego get in the way. Extract the signal from the noise, so you know what to pay attention to and what to ignore. Retention: Don’t Fill a Leaky Bucket. Understand what you forget and why. Learn to remember things not just for now but forever. Intuition: Dig Deep Before Building Up. Develop your intuition through play and exploration of concepts and skills. Understand how understanding works, and don’t recourse to cheap tricks of memorization to avoid deeply knowing things. Experimentation: Explore Outside Your Comfort Zone. All of these principles are only starting points. True mastery comes not just from following the path trodden by others but from exploring possibilities they haven’t yet imagined.

- Beyond principles and tactics is a broader ultralearning ethos. It’s one of taking responsibility for your own learning: deciding what you want to learn, how you want to learn it, and crafting your own plan to learn what you need to.

- If I have seen further it is by standing on the shoulders of giants. —Isaac Newton

- These two pieces in Everett's linguistic arsenal—a richly detailed map of how languages work and a method that provides a path to fluency—have allowed Everett to accomplish a lot more than just learning some simple sentences.

- A good ultralearning project, with excellent materials and an awareness of what needs to be learned, has the potential to be completed faster than formal schooling.

- I find it useful to break down metalearning research that you do for a specific project into three questions: "Why?," "What?," and "How?" "Why?" refers to understanding your motivation to learn. If you know exactly why you want to learn a skill or subject, you can save a lot of time by focusing your project on exactly what matters most to you. "What?" refers to the knowledge and abilities you'll need to acquire in order to be successful. Breaking things down into concepts, facts, and procedures can enable you to map out what obstacles you'll face and how best to overcome them. "How?" refers to the resources, environment, and methods you'll use when learning. Making careful choices here can make a big difference in your overall effectiveness.

- Instrumental learning projects are those you're learning with the purpose of achieving a different, nonlearning result.

- Intrinsic projects are those that you're pursuing for their own sake.

- If you're pursuing a project for mostly instrumental reasons, it's often a good idea to do an additional step of research: determining whether learning the skill or topic in question will actually help you achieve your goal.

- The main way you can do research of this kind is to talk to people who have already achieved what you want to achieve. Let's say you want to become a successful architect and think that mastering design skills might be the best step to take. Before you get started, it would be a good idea to talk to some successful architects to get a sense of whether they think your project will actually help with your intended goal.

- Don't ask for more than fifteen minutes or for ongoing mentorship.