This is a book about the gift that Wolfgang Amadeus Mozart, Sakakibara’s schoolchildren, and Ray Allen all shared—the ability to create, through the right sort of training and practice, abilities that they would not otherwise possess by taking advantage of the incredible adaptability of the human brain and body.

Why is this book worth our time?

#1 – For personal growth, for business effectiveness, we all need to know how to get “good” at something. This book provides tangible steps to help.

#2 – The science of expertise is transferable to areas not yet using such science. This book will help us think about getting good in areas not-yet-thought-about (in other words, not just chess, or athletics, or…).

#3 – This book will help us understand that everyone – yes, everyone – can develop genuine expertise.
Quotes and excerpts from the book – (the “best of” Randy’s highlights):

1. WHY ARE SOME PEOPLE so amazingly good at what they do? 50

2. And over time I’ve come to understand that, yes, these people do have an extraordinary gift, which lies at the heart of their capabilities. But it is not the gift that people usually assume it to be, and it is even more powerful than we imagine. Most importantly, it is a gift that every one of us is born with and can, with the right approach, take advantage of. In short, perfect pitch is not the gift, but, rather, the ability to develop perfect pitch is the gift—and, as nearly as we can tell, pretty much everyone is born with that gift. 123

3. But since the 1990s brain researchers have come to realize that the brain—even the adult brain—is far more adaptable than anyone ever imagined, and this gives us a tremendous amount of control over what our brains are able to do. 131

4. Yes, in some cases genetic endowment makes a difference, particularly in areas where height or other physical factors are important. A man with genes for being five feet five will find it tough to become a professional basketball player, just as a six-foot woman will find it virtually impossible to succeed as an artistic gymnast at the international level. 148

5. This is a book about the gift that Wolfgang Amadeus Mozart, Sakakibara’s schoolchildren, and Ray Allen all shared—the ability to create, through the right sort of training and practice, abilities that they would not otherwise possess by taking advantage of the incredible adaptability of the human brain and body. 168

6. Since antiquity, people have generally assumed that a person’s potential in any given field is inevitably and unavoidably limited by that person’s inherent talent. According to this view, each of us is born with a set of fixed potentials—a potential for music, a potential for mathematics, a potential for sports, a potential for business—and we can choose to develop (or not) any of those potentials, but we cannot fill any one of those particular “cups” up past its brim. But we now understand that there’s no such thing as a predefined ability. The brain is adaptable, and training can create skills—such as perfect pitch—that did not exist before. This is a game changer. In this new world it no longer makes sense to think of people as born with fixed reserves of potential; instead, potential is an expandable vessel, shaped by the various things we do throughout our lives. 181
Why are some people so amazingly good at what they do?

7. Learning isn’t a way of reaching one’s potential but rather a way of developing it. We can create our own potential. 183

8. In short, I have been asking, What works and what doesn’t and why? 187

9. But sometimes these books leave the impression that heartfelt desire and hard work alone will lead to improved performance—“Just keep working at it, and you’ll get there”—and this is wrong. 191

10. The right sort of practice carried out over a sufficient period of time leads to improvement. Nothing else. 193

11. This book’s focus will be mostly on the mental side of expert performance, although there is certainly a significant physical component to expertise in sports and other athletic endeavors. 211

12. Some genetic factors may influence a person’s ability to engage in sustained deliberate practice—for instance, by limiting a person’s capability to focus for long periods of time every day. 218


14. Indeed, Anthony Tommasini, the music critic at the New York Times, once commented that musical ability has increased so much since Cortot’s time that Cortot would probably not be admitted to Juilliard now. 319

15. We live in a world full of people with extraordinary abilities—abilities that from the vantage point of almost any other time in human history would have been deemed impossible. 326

16. What the second half of the twentieth century did see was a steady increase in the amount of time that people in different areas devoted to training, combined with a growing sophistication of training techniques. …This was true in a huge number of fields, particularly highly competitive fields such as musical performance and dance, individual and team sports, and chess and other competitive games. 337

17. I have devoted my career to understanding exactly how practice works to create new and expanded capabilities, with a particular focus on those people who have used practice to become among the best in the world at what they do. 351

I have found that no matter what field you study, music or sports or chess or something else, the most effective types of practice all follow the same set of general principles. 353

...the most effective and most powerful types of practice in any field work by harnessing the adaptability of the human body and brain to create, step by step, the ability to do things that were previously not possible. 357
18. Furthermore, the practitioners in the various fields built their bodies of knowledge in isolation, with no sense that all of this was interconnected—that the ice-skater who was working on a triple axel was following the same set of general principles as, say, the pianist working to perfect a Mozart sonata. 364

19. Generally the solution is not “try harder” but rather “try differently.” ...It is a technique issue, in other words. 513

20. The best way to get past any barrier is to come at it from a different direction, which is one reason it is useful to work with a teacher or coach. 521

21. And sometimes it turns out that a barrier is more psychological than anything else. 523

22. So here we have purposeful practice in a nutshell: Get outside your comfort zone but do it in a focused way, with clear goals, a plan for reaching those goals, and a way to monitor your progress. Oh, and figure out a way to maintain your motivation. 560

23. Trying hard isn’t enough. Pushing yourself to your limits isn’t enough. 605

24. Recent studies have shown that learning a new skill is much more effective at triggering structural changes in the brain than simply continuing to practice a skill that one has already learned. 838
   The brain, like the body, changes most quickly in that sweet spot where it is pushed outside—but not too far outside—its comfort zone. 840
   In every area that scientists have studied, the findings are the same: long-term training results in changes in those parts of the brain that are relevant to the particular skill being developed. 876

25. They live in the world of “good enough.” 940
   And, for the most part, that’s okay. “Good enough” is generally good enough. But it’s important to remember that the option exists. If you wish to become significantly better at something, you can. 944

26. The traditional approach is not designed to challenge homeostasis. It assumes, consciously or not, that learning is all about fulfilling your innate potential and that you can develop a particular skill or ability without getting too far out of your comfort zone. 946
   In this view, all that you are doing with practice—indeed, all that you can do—is to reach a fixed potential. 948
   With deliberate practice, however, the goal is not just to reach your potential but to build it, to make things possible that were not possible before. 949

27. Research has shown that the amount of time spent in this sort of analysis—not the amount of time spent playing chess with others—is the single most important predictor of a chess player’s ability. It generally takes about ten years of this sort of practice to reach the level of grandmaster. ...Simon estimated that by the time a chess player becomes a master, he or she has accumulated some fifty thousand of these chunks. 1060

28. The way that grandmasters process and make sense of chess positions is an example of a mental representation. It is their way of "seeing" the board, and it’s quite different from how a novice would see the same board. ...In short, while the mental representations give masters a view of the forest that novices lack, they also allow masters to zero in on the trees when necessary. 1083

29. Consider a competitive diver working on a new dive. Much of the practice is devoted to forming a clear mental picture of what the dive should look like at every moment and, more importantly, what it should feel like in terms of body positioning and momentum.
   A key fact about such mental representations is that they are very "domain specific..."
   ...a diver’s mental representations will be useless for basketball. 1110

30. This explains a crucial fact about expert performance in general: there is no such thing as developing a general skill. 1111
31. The main thing that sets experts apart from the rest of us is that their years of practice have changed the neural circuitry in their brains to produce highly specialized mental representations, which in turn make possible the incredible memory, pattern recognition, problem solving, and other sorts of advanced abilities needed to excel in their particular specialties. 1149

32. In pretty much every area, a hallmark of expert performance is the ability to see patterns in a collection of things that would seem random or confusing to people with less well developed mental representations. In other words, experts see the forest when everyone else sees only trees. 1156

33. This explains why the most successful quarterbacks are generally the ones who spend the most time in the film room... More importantly, effective mental representations allow a quarterback to make good decisions quickly... Being able to make the right decision a tenth of a second faster can be the difference between a good play and a disastrous one—between, say, a completed pass and an interception. 1178

34. In other words, experienced climbers had developed mental representations of holds that allowed them to know without conscious thought what sort of grip was required for each hold they saw. 1189

35. Some of you will be more expert than others in the task of understanding and assimilating the information contained in this book. 1208

36. Surgeons, for example, will often visualize an entire surgery before making the first incision. ...Developing such mental representations of a surgery is one of the most challenging—and most important—things that a surgeon can do, and more experienced surgeons generally create more sophisticated and more effective representations of these procedures. 1297

37. The main purpose of deliberate practice is to develop effective mental representations, and, ...mental representations in turn play a key role in deliberate practice. 1338

38. In general, mental representations aren’t just the result of learning a skill; they can also help us learn. 1356

39. In any area, not just musical performance, the relationship between skill and mental representations is a virtuous circle: the more skilled you become, the better your mental representations are, and the better your mental representations are, the more effectively you can practice to hone your skill. 1401

40. Think of gymnastics, diving, figure skating, or dancing. Performers in these areas must develop clear mental representations of how their bodies are supposed to move to generate the artistic appearance of their performance routines. 1440

41. In short, there were no students who just loved to practice and thus needed less motivation than the others. These students were motivated to practice intensely and with full concentration because they saw such practice as essential to improving their performance. 1586

42. We found that the best violin students had, on average, spent significantly more time than the better violin students had spent, and that the top two groups—better and best—had spent much more time on solitary practice than the music-education students. 3,420 hours 5,301 hours 7,410 hours

Looking more closely, we found that the largest differences in practice time among the three groups of students had come in the preteen and teenage years. 1600

43. By now it is safe to conclude from many studies on a wide variety of disciplines that nobody develops extraordinary abilities without putting in tremendous amounts of practice. 1636

44. Deliberate practice is purposeful practice that knows where it is going and how to get there. 1669
45. In short, deliberate practice is characterized by the following traits: 1670
   Deliberate practice develops skills that other people have already figured out how to do and for which
effective training techniques have been established. 1671
   Deliberate practice takes place outside one’s comfort zone and requires a student to constantly try things
that are just beyond his or her current abilities. Thus it demands near-maximal effort, which is generally not
enjoyable. 1673
   Deliberate practice involves well-defined, specific goals and often involves improving some aspect of the
target performance; it is not aimed at some vague overall improvement. 1675
   Deliberate practice is deliberate, that is, it requires a person’s full attention and conscious actions. 1679
   Deliberate practice involves feedback and modification of efforts in response to that feedback. 1681
   Deliberate practice both produces and depends on effective mental representations. 1684
   Deliberate practice nearly always involves building or modifying previously acquired skills by focusing on
particular aspects of those skills and working to improve them specifically... 1688

46. This is the basic blueprint for getting better in any pursuit: get as close to
deliberate practice as you can. 1728
   In practice this often boils down to purposeful practice with a few extra steps:
first, identify the expert performers, then figure out what they do that makes
them so good, then come up with training techniques that allow you to do it,
too. 1730

47. ...be careful when identifying expert performers. 1770

48. Lesson: Once you have identified an expert, identify what this person does differently from others that could
   explain the superior performance. 1806

49. Gladwell did get one thing right, and it is worth repeating because it’s crucial:
   becoming accomplished in any field in which there is a well-established history
of people working to become experts requires a tremendous amount of effort
exerted over many years. It may not require exactly ten thousand hours, but it
will take a lot. 1875

50. But I see the core message as something else altogether: In pretty much any
   area of human endeavor, people have a tremendous capacity to improve
their performance, as long as they train in the right way. 1890

51. In those combats the pilots were expected to push their planes—and themselves—right up to the edge of
   failure in order to learn what the planes were capable of and what was required to get that performance out
of them. 1921
52. ...the real action occurred once the pilots landed, in what the navy called “after-action reports.” ...What did
   you notice when you were up there? What actions did you take? Why did you choose to do that? What were
   your mistakes? What could you have done differently? 1929

53. This distinction between knowledge and skills lies at the heart of the difference between traditional paths
toward expertise and the deliberate-practice approach. 2139

54. But one thing is clear: with few exceptions, neither doctors nor nurses gain expertise from experience alone.
   2178

55. Training should focus on doing rather than on knowing—and, in particular, on
   bringing everyone’s skills closer to the level of the best performers in a given
area. 2245

56. The researcher Daniel Chambliss concluded that the key to excellence in swimming lay in maintaining close
attention to every detail of performance, “each one done correctly, time and again, until excellence in every
detail becomes a firmly ingrained habit.”
This is the recipe for maximum improvement from your practice.

57. Maintaining this sort of focus is hard work...even for experts who have been doing it for years.

58. The hallmark of purposeful or deliberate practice is that you try to do something you cannot do—that takes you out of your comfort zone—and that you practice it over and over again, focusing on exactly how you are doing it, where you are falling short, and how you can get better.

59. First, figure out exactly what is holding you back. What mistakes are you making, and when? Push yourself well outside of your comfort zone and see what breaks down first. Then design a practice technique aimed at improving that particular weakness. Once you’ve figured out what the problem is, you may be able to fix it yourself, or you may need to go to an experienced coach or teacher for suggestions. Either way, pay attention to what happens when you practice; if you are not improving, you will need to try something else.

60. The ones who are successful in losing weight over the long run are those who have successfully redesigned their lives, building new habits that allow them to maintain the behaviors that keep them losing weight in spite of all of the temptations that threaten their success.

61. Or maybe it's for totally practical, extrinsic purposes. You hate public speaking, but you recognize that your lack of speaking skills is holding you back in your career, so you decide you want to learn how to address an audience.

62. If you stop believing that you can reach a goal, either because you’ve regressed or you’ve plateaued, don’t quit.
Make an agreement with yourself that you will do what it takes to get back to where you were or to get beyond the plateau, and then you can quit. You probably won’t.

63. One of the best bits of advice is to set things up so that you are constantly seeing concrete signs of improvement, even if it is not always major improvement.
It doesn’t matter if the levels are arbitrary. What matters is that the teacher divides up what can look like an infinite amount of material to learn into a series of clear steps, making the student’s progress more concrete and more encouraging.

64. Musicians enjoy performing music. Mathematicians enjoy doing mathematics. Soccer players enjoy playing soccer.

65. In fact, people can train effectively well into their eighties.

66. There are no big leaps, only developments that look like big leaps to people from the outside because they haven’t seen all of the little steps that comprise them.

67. In other words, they worked harder than everyone else.

68. Progress is made by those who are working on the frontiers of what is known and what is possible to do, not by those who haven’t put in the effort needed to reach that frontier.

69. A number of Nobel Prize–winning scientists have had IQs that would not even qualify them for Mensa, an organization whose members must have a measured IQ of at least 132, a number that puts you in the upper 2 percentile of the population. Richard Feynman, one of the most brilliant physicists of the twentieth century, had an IQ of 126; James Watson, the co-discoverer of the structure of DNA, had an IQ of 124; and William Shockley, who received the Nobel Prize in Physics for his role in the invention of the transistor, had an IQ of 125.
The bottom line is that no one has ever managed to figure out how to identify people with “innate talent.”

But since we know that practice is the single most important factor in determining a person’s ultimate achievement in a given domain, it makes sense that if genes do play a role, their role would play out through shaping how likely a person is to engage in deliberate practice or how effective that practice is likely to be.

But there is, I believe, an even more urgent reason to emphasize the role of practice over that of innate differences, and that is the danger of the self-fulfilling prophecy.

I believe that there is much that expert performers and aspiring expert performers can do to improve their training.

In reality, much of the training that athletes do—especially athletes in team sports—is carried out in groups with no attempt to figure out what each individual should be focusing on.

Education is one of those areas. Education touches everyone, and there are a number of ways that deliberate practice could revolutionize how people learn.

When preparing a lesson plan, determining what a student should be able to do is far more effective than determining what that student should know. It then turns out that the knowing part comes along for the ride.

Generally speaking, in almost any area of education the most useful learning objectives will be those that help students develop effective mental representations.

The questions and tasks were also designed to push the students outside their comfort zones—to ask them questions whose answers they’d have to struggle for—but not so far outside their comfort zones that they wouldn’t know how to start answering them.

Most people, even adults, have never attained a level of performance in any field that is sufficient to show them the true power of mental representations to plan, execute, and evaluate their performance in the way that expert performers do. And thus they never really understand what it takes to reach this level—not just the time it takes, but the high-quality practice.

That is why experts in one field can often appreciate those in other fields.

If we can show students that they have the power to develop a skill of their choice and that, while it is not easy, it has many rewards that will make it worthwhile, we make it much more likely that they will use deliberate practice to develop various skills over their lifetimes.

Over time, then, by learning more about what goes into expert performance in various fields and by creating a generation of students primed to take advantage of that, we could produce a new world, one in which most people understand deliberate practice and use it to enrich their lives and their children’s. …What kind of world would that be?

Imagine a world in which doctors, teachers, engineers, pilots, computer programmers, and many other professionals honed their skills in the same way that violinists, chess players, and ballerinas do now.

Homo sapiens. …We call ourselves “knowing man.” …But perhaps a better way to see ourselves would be as Homo exercens, or “practicing man,” the species that takes control of its life through practice and makes of itself what it will.

Two hundred years ago a person could learn a craft or trade and be fairly certain that that education would suffice for a lifetime. People born in my generation grew up thinking the same way: get an education, get a job, and you’ll be set until you retire. That has changed in my lifetime. Many jobs that existed forty years ago have disappeared or else have changed so much as to be almost unrecognizable.

I think it’s safe to say that the changes won’t be slowing down.

In the future most people will have no choice but to continuously learn new skills, so it will be essential to train students and adults about how to learn efficiently.
Some of the Key Content and Ideas from the Book

• **About the author, Anders Ericsson**
  o Has studied musicians (especially violinists); athletes; has trained memory experts...has studied expertise over for a long time!

• **Some Stories**
  o The 69 year old takes up karate -- (Per Holmlöv)
  o The 30 year old takes up golf – (Dan McLaughlin)
  o The parents who raised three female grandmasters in chess; and the dad who raised two tennis champions – (The Polgärs; Richard Williams)
  o The hockey player and his brothers (and their makeshift hockey rink in the basement) – Mario Lemieux
  o The swimmer learns to focus on each stroke – (Natalie Coughlin)
  o The music prodigy and the “teacher” father – (Mozart)
  o The “memory” champion and the hours of deliberate practice – (Steve Faloon)
  o The London taxi driver test
  o The Navy fighter pilot training - (Top Gun)
  o The legendary figure who wanted to learn to write well – (Ben Franklin)

• **The problem:**
  o We get “good enough,” and then we quit improving

• **It works like this**
  o It takes time; lots of time (“10,000” hours of time – not a precise rule, but... a lot! of time; a whole!!! lot!!! of time)
  o BUT/AND... that time has to be spent in purposeful, deliberate practice
  o The Three “Fs” – Focus; Feedback; Fix it

• **So, what is practice? – Moving from “naïve” practice, to purposeful practice, to the Gold Standard deliberate practice**
  o **Purposeful Practice:**
    o Practice focusing on “fixing” deficiencies
    o Practice with a progression toward greater expertise
    o Practice over the long haul
    o Practice on both the “physical,” (maybe, take lots of naps), and the “mental imagery” (“mental representations”) – (“without conscious thought”)
    o Solitary practice (able to practice, with great discipline, when it is “not much fun,” over the long haul!)

  o **And, Deliberate Practice requires:**
    ▪ First, it requires a field that is already reasonably well developed...
    ▪ Second, deliberate practice requires a teacher who can provide practice activities designed to help a student improve his or her performance.

• {From the book: PURPOSEFUL PRACTICE
  o Purposeful practice has well-defined, specific goals.
  o Purposeful practice is all about putting a bunch of baby steps together to reach a longer-term goal.
  o Purposeful practice is focused.
  o Purposeful practice involves feedback.
  o Purposeful practice requires getting out of one’s comfort zone.}
• Some Myths
  o If all depends on innate ability – not true (although, in some athletic pursuits, body size plays a role)
  o Some are just “naturals” – sure, after many, many hours, and years, of deliberate practice
  o The myth of some expertise (consider “wine experts”)
  o You will get better “naturally” if you do something long enough... nope! Not even with “effort.” It takes “deliberate practice.”

• This is Interesting
  o Brains actually change (parts of the brain grow larger) after years of deliberate practice
  o But, only in one part of the brain (one improvement in the brain does not lead to other improvements; London cab drivers know London, but have not improved in other memory abilities)
  o IQ matters very little – deliberate practice trumps IQ
  o Tears of “experience” doing things “the same way” will not lead to improvement. It might even lead to deterioration of skills. But, deliberate practice can lead to continual improvement.
  o Some (many) doctors get “worse”

• A few thoughts on motivation
  o The early role of parental attention (and approval)
  o (It costs a lot of money to raise an expert)
  o It grows into intrinsic motivation
  o But there is likely always a mix of intrinsic and extrinsic motivation

The Book:
Introduction: The Gift
The Power of Purposeful Practice
Harnessing Adaptability
Mental Representations
The Gold Standard
Principles of Deliberate Practice on the Job
Principles of Deliberate Practice in Everyday Life
The Road to Extraordinary
But What About Natural Talent?
Where Do We Go from Here?

Some Lessons and Takeaways
1. You need something to “deliberately practice” – something to work at, over the long haul, with purposeful, deliberate practice.
2. You need a knowledgeable, skilled, expert who is also good at teaching/coaching, to help you improve.
3. You need to follow the path of “deliberate practice.”
4. You need to enhance “doing,” don’t just increase “knowing” (the old “knowing-doing gap”).
5. Can I recommend this question – “what are you bad at?” – and, be honest with yourself.
6. Develop your “next steps” – choose a skill to work on; find a good teacher (one-on-one is far more effective than group sessions); schedule solitary practice, regularly! (one hour a day, minimum...); work on incremental, identifiable progress steps, just outside your comfort zone; keep your schedule.