

Range – David Epstein

Notes and Takeaways

“And he refused to specialize in anything, preferring to keep an eye on the overall estate rather than any of its parts...And Nikolay’s management produced the most brilliant results.” – Leo Tolstoy

“No tool is Omni competent. There is no such thing as a master-key that will unlock all doors. – Arnold Toynbee

The average age of the founder for the fastest growing startups is 45 years old

- o Age doesn’t matter
- o Experience in other areas unrelated to core business can benefit entrepreneurs

Overspecialization can lead to collective tragedy when individuals separately take the most reasonable course of action and the mother ship fails

- o Highly specialized health care professionals have developed their own version of the “if all you have is a hammer, everything looks like a nail” problem
- o Increased specialization has created a “system of parallel trenches” in the quest for innovation
- o Everyone is digging deeper into their own trench and rarely standing up to look in the next trench over, even though the solution to their problem happens to reside there

The challenge we all face is how to maintain the benefits of broad and diverse experience, interdisciplinary thinking, and delayed gratification in a world that increasingly incentivizes, even demands, hyper specialization and immediate results

When patterns do not clearly repeat, repetition does not enable learning

- o We learn to group recurring information into chunks to make things quicker and more understandable to us in the future

The more thinking shifts to a wide open world of possibilities and thus a big picture strategy, the more humans can add because they can connect dots and create broad inferences that a computer cannot

- o The bigger the picture the more unique the potential human contribution
- o Our greatest strength is the exact opposite of narrow specialization – it is the ability to integrate broadly
- o In a narrow enough world, humans may not have much to contribute much longer – In more open realms they certainly will
- o The progress of AI has been limited to a closed and orderly world with precisely defined rules and that does not reflect actual reality

- For example, in a truly wide open world, where real life problems are devoid of rigid rules and reams of perfect historical data, AI has been disastrous and has failed miserably

A study found that experienced accountants asked to use a new tax deduction that replaced a previous one did worse integrating the new deduction than novice CPAs

Creative achievers tend to have broad interests

- o This breadth often supports insights that cannot be attributed to domain specific expertise alone

Modern work demands knowledge transfer: the ability to apply knowledge to new situations and different domains, an extreme example:

- o A sophisticated city dweller traveling through the desert will be completely dependent on a nomad to keep him alive. So long as they remain in the desert, the nomad is the genius of the two

In a study it was found that the correlation between broad conceptual thinking and GPA was about zero

Everyone needs habits of the mind to dance across disciplines

75 percent of college graduates go on to careers unrelated to their major

One good tool is rarely enough in a complex, interconnected, rapidly changing world

- o No tool is Omni competent

When it comes to musical instruments, nearly all of the most accomplished musicians had played at least three or more instruments

- o Same concept applies to dominant sport athletes, they tended to play multiple sports growing up which included their “natural talent” sport

The more broad context required to learn something, the more the learner creates abstract models and the less they rely on any particular example or method

- o Learners then become better at applying their knowledge to a situation they’ve never seen before and that is the essence of creativity

When you are self-taught you experiment more, trying to find different solutions to a single problem, thus giving you a broad range of knowledge while you learn

Struggling to retrieve information primes the brain for subsequent learning, even when the retrieval is unsuccessful

- o Telling yourself you will remember in a few minutes will help prime the brain and memory and you are much more likely to remember

Repetition is far less important than struggle

- o Hard work creates the best learning environment even when it feels tough at the time
- o Repeating things over and over again is not learning, this can produce a misleading sense of mastery
- o Being frustrated is a sign that real learning is going on, easy and comfortable feelings often indicate just the opposite

- o Asking connection questions are a great way to learn and to improve the cognitive brain

Best way to expand knowledge is to allow deep learning to occur with short term struggles yielding long term gains

For knowledge to be valuable, it should be learned under varied conditions, an approach known as “carried or mixed” learning

Desirable difficulties like hard testing and spacing out the learning timeline were activities that made knowledge “stick”

- o Knowledge becomes durable and flexible when taught as above
- o Experiencing progress reinforces the instinct to do more of the same
- o Learning deeply means learning more slowly
 - The myth of the “head start” fails the learners it seeks to serve

Deep analogical thinking is the practice of recognizing conceptual similarities in multiple domains or scenarios that seem to have little in common at first glance

- o Analogical thinking takes the new and makes it familiar, and puts a new light on it which allows humans to reason through problems they have never seen in unfamiliar context

It was found that teachers are more effective at improving student performance after they switch to a new school and the effect is not explained by switching to higher-achieving schools

Striving to accomplish a single overarching goal every day means you have grit, determination, and resilience

- o The ability to pull yourself together mentally and physically in sporting competition is different from the new challenge that confronts the analogical thinker
- o Periodically freeing your mind up on tasks that don’t have clear timelines or goals helps to help refresh the mind to come at any goal with a new perspective
- o Bottom line: put in work now to reap the benefits later

Always keep your mind open regardless of the scenario, then you will take something from every new experience

Career goals that at one time were desired can appear ludicrous in hindsight when shone in the light of future self-knowledge

- o Our preferences and life goals do not stay the same because WE DO NOT stay the same
- o The person you are today is fleeting, your future self will be completely different
 - Tattoo example: if you got a tattoo at 20 it is statistically likely that the art you were passionate enough to get inked on your body WILL NO LONGER interest you even half as much as it did

Adults tend to become more agreeable, content, emotionally stable, and less neurotic with age, but also less open to new experiences

- o As one ages, an individual often responds to a particular situation in a similar way as their younger self, BUT sometimes their reaction can be surprisingly different – this is called the “context principle”
 - Example: people can be introverts in some scenarios and extroverts in others
- o If an employee works in a job that suits them, they’ll likely work harder and the exterior resolve will be obvious to others

Often good things in life can be traced back to misfortune

- o When bad things or bad luck happen, accept that you do not know the reason why, stay optimistic and be eager to find out how this takes you to a better place in life

InnoCentive is company that seeks solutions from far outside traditional training and inquiry

- o It posts complex biological, design, and structural questions on the web and people sign up to submit answers from all walks of life
- o The company has had some incredible success which reinforces the range theory of learning

The more specialists create the need for input and answers to questions, the more opportunity exists for curious outsiders to make valuable contributions by connecting widely available but disparate information to solving the problem at hand

- o The larger and more easily accessible the library of human knowledge (the internet), the more chance for inquisitive patrons to make connections, solve intractable riddles and create learning at the cutting edge

The average “expert” is a terrible forecaster

- o Despite special training and education, years of experience, academic degrees, and even access to classified information - their forecasts were no better than anyone else - why? They can’t know the future anymore than any average Joe
- o Many experts never admit to systematic flaws in their judgement, their ego gets in the way of making a meaningful contribution
 - Victories were total victories, and defeats were always just a touch of bad luck away from having been victories too

The best collaborators and predictors talk through their ideas to find out where their assumptions may be weak, thus their conclusions wrong

- o The best forecasters were shown to be effective collaborators
- o The craftiest forecasters were good on their own, but as a team they become better, greater than the sum of their individual parts

Experienced groups become rigid under pressure and “regress to what they know best”

- o “If I make a decision, it is a possession, I take pride in it, I tend to defend it, and not listen to those who question it”

To come up with the best solution to a problem, one needs to let the brain think about something different from the daily grind

It is best to think laterally across a multitude of disciplines and experiences to find a new path to the best answers

Progress generally evolves from the free play of intellects, working on subjects of their own choosing on their own timeline

People usually feel that lunch is an inefficient use of time in the middle of the day, but actually it can be the most productive part of the work day

- o It is a break from the daily task and allows for ideas and connections to be discussed and mulled over, like deep sleep allows us to do in our subconscious over the course of the night

Original people who create new things/ideas tend to strike out a lot, but they are also the ones who hit grand slams

- o Keep swinging

Compare yourself to yourself yesterday and no one else

- o Grow and broaden your horizons, look for incremental daily improvement
- o Everyone progresses at different speeds, so don't let anyone else make you feel bad or behind

When you move on to a new area of work, that experience is not wasted, everything that you have learned you will apply it in what you do next even if only subconsciously