Systems Based Gamification: Play, Complex Science and Strategy

By Eugene Sheely

Part Three: Strategy

1

What exactly is strategy? Is it reading Sun Tzu and deciding that you can follow a set of rules? Is it reading another modern book detailing the "new ten funky strategies for... whatever"? The problem with modern strategic thought in the West is that it has removed the tacit element from strategy. This is a conclusion in the book *Strategy: A History* by Lawrence Freedman. In it he explains what happened to Western thought:

During the Napoleonic wars the intellectuals inspired by the enlightenment wanted to find universal principles for strategy from Napoleons campaigns. From this they determined that

strategy was following a codified set of rules that would achieve results in complex areas like war. They believe that the whole world was casual based on Newtonian physics and fallaciously applied this beliefs into human systems. This belief in being able to explain and predict the world through explicit knowledge became the foundation of Western strategic texts.

While the intellectuals of the enlightened were busy looking for scientific principles of war in Napoleons campaigns, Napoleon was giving his advice:

"...generalship is acquired only by experience and the study of the campaigns of all great captains."

Tacit knowledge is acquired by experience and narratives.

"Read over and over again the campaigns of Alexander, Hannibal, Caesar, Gustavus, Turenne, Eugene and Frederick. Make them your models. This is the only way to become a great general and to master the secrets of the art of war. With your own genius enlightened by this study, you will reject all maxims opposed to those of these great commanders."

Napoleon was once asked what principles of war he followed, he answered that none. By this he meant that he allowed his genius to determine his actions depending on the contexts of the situation. In the movie *Enter The Dragon Bruce* Bruce Lee's master

asks him what is the highest technique he expects to achieve, Bruce Lee answers that it's to have no technique.

Essentially what this is saying is that strategy is at its core a tacit skill. You can only acquire tacit knowledge by experience and narrative (but remember that explicit knowledge augments it). One reason that ex-Google CEO Eric Schmidt says that today's generation has become better at strategy in business is that gamers have developed a tacit skill for problem solving. But always keep this notion in context. As Jane McGonigal says, too much time playing video games begins to have a negative effect. People who spend too much time playing and not experiencing the real world aren't capable to navigate it properly.

2

If we accept that play can be games, art and stories (remember the author Brian Boyd in the Play section of this series) then we can look for historical examples that determine if these activities have a beneficial manifestation in serious non-play activities in the real-world. Lets take ancient Greece and contrast Sparta and Athens. The Spartans took away all forms of "play" (music, literature, etc) since they deemed it a waste of time and dedicated themselves exclusively to military training. The Athenians trained with games in sports, while being a big fan of the arts in pottery, sculpture, rhetoric, music, theater, etc.

From this we determine that Spartan culturally rejected "play," while Athens embraced it. One of the most important works of literature in the Western world is *The History of the Peloponnesian War* by Thucydides where he describes the innovation and lack of between these two communities. In it Thucydides writes a speech made by the Corinthians to the Spartans. In it the Corinthians are trying to persuade their audience to think twice before declaring war on Athens and contrasts the cultural character of both city-states:

*"**The Athenians are addicted to innovation,** and their designs are characterized by swiftness alike in conception and execution; **you have a genius for keeping what you have got, accompanied by a total want of invention,** and when forced to act you never go far enough... It is the law as in art, so in politics, that improvements ever prevail; and though fixed usages may be best for undisturbed communities, constant necessities of action must be accompanied by the constant improvement of methods. Thus it happens that the vast experience of Athens has carried her further than you on the path of innovation."*

The ancient text written in the 5th BC has a very modern ring to it. The business community is obsessed with innovation (since in many cases it gives them a short time period with a competitive advantage before their competitors begins to imitate them) and is always stressing its need, but we rarely hear of practical ways to

achieve it. Notice that Thucydides writes that fixed usages may be best on undisturbed communities, this is the exact problem in business today. The volatility of our business world requires innovation for its mere survival. Best practice isn't practical in most areas in business, and swift improvisation and innovation are a necessity.

Now I have no objective evidence or outside sources, but my hypothesis is this:

1. Athens was obsessed with play while Sparta was not
2. Athens was innovative while Sparta was not
3. Play supercharges neurological patterns in a communities brains
4. Therefore one cause of Athens innovation was its cultural love for play

Faulty logic? Am I confusing correlation with causation? Perhaps, but I think I can make a strong argument. Leslie Paul Thiele explains in his book *Heart of Judgement* that what makes humans better at adapting to complexity is our ability to come up with novel solutions. This arises by the fact that human beings are pattern-based intelligences while computers are information-processing intelligences. Our neurons are always making new connections while computers tend to only operate on what you've programmed them to do.

"Developers of "expert systems" acknowledge that ***the most advanced com-***
puters fall well short of human virtuosos largely because of the machines'
inability to be inventive and integrative, to go beyond tried and true deci-
sion rules. *The technicians who developed Deep Blue, the computer*
that first beat chess grandmaster Gary Kasparov in 1997, rightly under-
stood their achievement as the construction of a sophisticated calculator,
not a machine capable of artificial intelligence. All efforts by technicians
to mimic the integrative judgment of a grandmaster, rather than simply
relying on fast and extensive computational power, have "failed miser-
ably." Leslie Paul Thiele, Heart of Judgements

This ability of a human virtuoso to be inventive and integrative (combining new ideas, our pattern-based intelligence) is to a large degree tacit. As Bryan Boyd argues in his book *On the Origins of Stories: Evolution, Cognition and Fiction* play is the evolutionary activity that supercharges our brain for the acquisition of these tacit patterns. If we become a culture where complex play and stories are some of our main forms of entertainment, we are destined to become more creative.

A lot of great strategists have been fans of literature. Charles Hill has a whole historical list in his superb book *Grand Strategies: Literature, Statecraft, and World Order* but I'll mention two contemporary ones: Mark Zuckerberg claims that his favorite book is the *Aeneas* by Virgil. Amazon CEO Jeff Bozos takes it a step further saying that he learns more from fiction than nonfiction.

Mao Tse Tung was an avid reader of literature (literature was illegal in China during his reign) and claim that he learned more about strategy from the 18th century masterpiece of Chinese literature *Dreams of the Red Chamber* than any other book. Mao didn't cite Sun Tzu, Clausewitz, Lenin, etc... He sites a fictional work that bases itself on girls trying to get a young dandy to fall in love and marry a particular girl as the major source for his strategic insights. **A romance novel had more impact in Mao Tse Tung's military and political strategy than all the major strategy books (which Mao read) from the time!** (But keep in mind he also read the strategic classic, its this is obvious in his writings).

There seems to be a pattern between being a superb strategist and utmost *realist* and interacting with literature (both reading and writing):

Niccolo Machiavelli wrote the most influential book in the history

of political strategy, *The Prince (*I find his less known work *Discourses On Livy* to be his masterpiece*)*, but also wrote what many consider to be the best work of fiction from the Italian Renaissance: *The Mandrake.*

Napoleon Bonaparte originally wanted to be a writer, he attempted a history of Corsica in his youth, while writing several short fictions. You can buy a book titled *Napoleon Wrote Fiction* by Christopher Frayling, very interesting insights from it.

Winston Churchill was an avid reader and writer in his youth. Alexander the Great took with him *The Iliad* during his military conquests and read it every night, etc.

Remember the second section where I talked about Ann Pendleton-Jullian. She had her students play and design games, this changed their brains at a tacit level which made them better strategist at solving architectural problems. If literature is also play, could it be that reading and writing literature changes the brain to make individuals better at solving the realities of social problems**?**

But is all this a coincidence**?** Cognitive psychologist Kieth Oatley has been doing research on the effects of fiction on the brain. His conclusion is that fiction serves as a simulator in the brain that has us live the complexities of the social world:

"This is why I liken fiction to a simulation that runs on the software of our minds. And it is a particularly useful simulation because negotiating the social world effectively is extremely tricky, requiring us to weigh up myriad interacting instances of cause and effect. Just as computer simulations can help us get to grips with complex problems such as flying a plane or forecasting the weather, so novels, stories and dramas can help us understand the complexities of social life." Kieth Oatley

Does the idea that fiction works like a pilots simulator sound weird? It did to me. Professor of psychology at Harvard Daniel Gilbert wrote an interesting book (I also highly recommend for gamification designers) called *Stumbling on Happiness*. In it he claims that one of the things that separate human beings from other animals is our capacity to have "experience simulations" in our heads.

If someone were to tell you to replace your morning coffee's sugar with salt and add some tabasco sauce you would immediately reject their advice. You've never tasted that particular combination of ingredients, but your brain immediately simulates the possible taste of this combination and rejects it.

"We are the only animal on the planet that learns from mistakes we haven't personally made, because "imagination is a life simulator." Daniel Gilbert

Imagination is play with mental patterns. Homer described Odysseus as the best man alive for both plots and storytelling, there's been a known link between strategy and storytelling since ancient times.

“Few people have the imagination for reality” -Goethe

If imagination enhances a particular part of our brain that creates “experience simulations” then play is a way to train and improve its performance, which then translates to the necessary “mental simulations” we use to navigate the world. That is to say: when we use our imagination we’re probably strengthening the area of the brain that create the “experience simulations” Daniel Gilbert describes that helps us navigate the real world.

Play may very well be like a gym for our imagination, but imagination has to be grounded in practical intelligence and facts, it needs an understanding of the complex realities of our world when used in strategy. As the British philosopher Mary Midgley explains, there needs to be a combination of science and poetry.

There are many idiots who can't tell the difference between a creative idea that is pure fantasy and a creative one with practical applications. For imagination to be useful it has to be grounded in reality. So play is good, but don’t abandon history and the practical “how-to” content either!

There's limitations to what you can do: time, resources and positions of maneuver are few. You have to understand the world and come up with a solution with the cards you've been dealt with. Remember the top brain and bottom brain theory of intelligence. People who can't understand the world (only top brains working properly) are making all sorts of plans that don't work. These plans tend to be very creative, but they're useless. You need both brains to work in order to develop proper strategies, innovation may look dull at times, but it gets the job done.

Sometimes the simple and direct plans are the best, but don't be seduced with this notion either. In complex problems its actually indirection and paradoxes that work best. Buy the book by British economist John Kay *Obliquity: Why Our Goals Are Best Achieved Indirectly* (also a must read!). In business we tend to over-rely on rationality and common sense, this isn't always the best course.

This is why I believe that *emergent gamification* will solve the engagement problem in many cases much better than the traditional gamification techniques of trying to directly increase engagement by induce fun or happiness. That is to say, develop complex adaptive systems with feedbacks similar to those from popular MMO's as Michael Hugos suggests. It can't always be a "pleasure revolution," the world will not easily bend to our goals, we will encounter pain, sweat and tears but at the end we won't have lived a boring life!

"In the realm of strategy, only contradiction and paradox work. Common sense and straightforward linear logic always fails"
-Edward Luttwak

4

Another positive skill that develops during play and stories that transfers into strategy is the development of something called A Theory of Mind. ToM manifests itself in many social animals, most notably primates and humans. Its the ability to have a theory on what another person is thinking. Developing ToM is a precursor for metacognition, so being social is vital for abstract and strategic thinking.

Theory of mind allows us to have empathy with other people, which helps us to bond with each other. But its also used for Machiavellian intelligence, that is the ability to manipulate other people. Machiavellianism usually holds negative connotations since

it can be used to hurting others, and its deem elitist since Machiavelli advised Princess, but this is an over simplistic view developed in the book *Chimpanzee Politics (*It's a great book by the way*)*.

Any type of design requires Machiavellian intelligence since we're essentially trying to understand other people and manipulate them, but it's not necessarily a negative thing. Movies, songs, novels, video games, magic shows etc are all trying to manipulate our emotions in order to entertain us. When the girl in a couple throws a surprise party for her boyfriend she's trying to manipulate him into having positive emotions.

One possibly negative aspect of this intelligence is when people like the character Frank Underwood from *House of Cards* goes around causing havoc for their own political agendas. If you've seen the series you've notice how he understands what others are thinking and manipulates them accordingly.

You can't separate the "negative" from the "positive." Think about moths: Biologist David Sloan Wilson explains that the same adaptation that allowed moths to navigate with the light of the stars has them fly into a campfire to their death. ToM is an adaption that can't be selected for certain behaviours, you must take in the "good" and the "bad" with it.

Even when people are manipulating each other they may think it

a good thing, they're trying to screw up your plans “out of love” with all sorts of deceptions. These are usually the most dangerous manipulators who will deny their schemes to themselves and give it other names.

Stories increase ToM by exercising our analytical muscles: We try to understand the motives or figure out what one of the characters is actually trying to accomplish. Another is a scientific phenomena called “speaker-listener neural coupling.” This is a weird one that sounds straight out of science fiction:

When a speaker is telling a story and the listener is engaged, the listener will begin to synchronize with the same brain waves rhythm from the speaker while activating the same brain areas. So the listener can literally feel what the other person felt. This gives insight to other ways of thinking which helps us understand other people. It's also why people say that certain stories changed them. Their brain has literally been re-wired. Be discriminative with the fiction you consume.

Games also help with our ToM. Think about poker, it's all about guessing what the other person is thinking, and try to trick them into thinking something else.

Edward Luttwak, one of the most prominent strategies of our time claims that reading Sun Tzu won't make you a better strategists (Luttwak says it can actually make you worse. The book Obliquity

by John Kay says that its often better to focus on past experiences than theory). You're better off reading the *Iliad* he says, since this will develop your ToM which is the foundation of strategy.

This doesn't mean that reading or playing video games will necessarily make you a better strategist, this activities won't work unless you have real-world interaction. We've all met people who play 10 hours of video games a day or professors who are "absent minded" from being isolated from the real-world by reading their books and only talking to academics.

Children develop ToM by playing what is called "socio-dramatic play," which is role playing. This type of play is still useful as an adult. You should be trying to meet new and diverse types of people all the time in order to expand your ToM, fluid intelligence and social skills. Look up Deborah Gruendfeld from Stanford and Amy Cuddy from Harvard for career applications to socio-dramatic play as an adult in business settings.

5

Planning is not strategy. This is a statement made by Lawrence Freedman who wrote a history on strategy. As Carl von Clausewitz wrote: "*no battle plan survives first contact with the enemy.*" And "*the enemy of a good plan is the illusion of a perfect one.*" I think games instill 3 principles of strategy

Clausewitz talked about:

Friktion: This is the obstacles in place that are preventing you from realizing your goals. They may be self-induced: Maybe you're too lazy, maybe you're not talented enough, lack some knowledge or the courage to go through (starting a business teaches you to push harder and not be a little wimp. You tap into those extra energy reserves and keep moving).

In a chess game you can't just wish you win, you have to deal with the friction between your goal (capturing the opponent's king) and the obstacles to overcome (the pieces on the way being maneuvered by an opponent that wants to keep his king safe and capture yours). People who haven't been knocked into reality by attempting some venture always describe their plan to success in some linear method with few obstacles. They don't understand Friktion: all your initial plans will fail and you need to quickly adapt to destroy obstacles. Sadly many people give up quickly when something doesn't initially go their way.

Wecheselwirkung: There's no direct translation for this word from German to English. It means mutual altering, when I make a move, my opponent will make another. If you're playing a game of chess this is very obvious, you're always thinking on what to move in relation to the possible counter move from your opponent. Business strategists Michael Porter talks about gaining a competitive position that can't be imitated to detract competitors

from kicking you off the market. Strategy to a large degree is about what you do and don't do. Destroy your opponents capability to maneuver against you.

Kritik: This is referred to as **"**the eagles eye.**"** It's pretty much becoming a generalist (as opposed to being a specialist) and making interconnections between different aspects of a venture. In strategy it's called **"**grand strategy**"** if you want to research the concept further. Check out an article on Forbes titled: *The Secret Power of Generalists and Why They'll Rule the World.*

It's basically becoming an ecologist as was mentioned in the complexity section. In complex games like SimCity or Civilization you're creating and managing a complex ecology where everything is interconnected and learning the interrelationships between different agents. This type of thinking is shown to transfer into our daily lives. Complex games and complex literature develops the necessary tacit skills to understand and act on real world complex systems.

6

We have to reject all systematic approaches to strategy. The American obsession with Sun Tzu and other strategy books where you can read some rules on how to act is not going to get you anywhere. These only work in close systems where best practice can be discovered, open systems need human virtuosos who can

mix art and science in their field.

"Epistemologically speaking, the source of all erroneous views on war lies in idealist and mechanistic tendencies" -Mao Tse Tung

Carl von Clausewitz wrote in the introduction of book eight from On War that planning for this systematic approach was futile. Instead he argued that a general needed to have *coup d'oeil,* this means the ability to make quick decisions in just a few seconds. Malcolm Gladwell has a book called *Blink* that talks about the same principle, I have yet to read so won't comment on it but its a possible profitable reference.

The *coup d'oeil* is a concept promoted by many successful strategist from Frederick the Great, Napoleon Bonaparte to Asian martial artists. Yamamoto Tsunetomo stated in the book *Hagakure* that we should make decisions in the time space of seven breaths, or we'll over complicate things and they'll fail. Similarly Clausewitz points that we have to be quick in deciding and that our first impressions are usually the best.

I won't wholly agree with this, since long deliberate planning shows to have its usefulness. Napoleon Bonaparte would spend days locked in his office which were covered with maps, planning his campaign. And if you're in a complex system it might take you time to build empathy with others and build a successful strategy. But when you're in the battle, stop planning and act. But

to jump into action without a plan can be ruinous. You must win before you attack.

7

I'd like to put into a gamified context some of Miyamoto Musashi's quotes. I much prefer his book *The Book of Five Rings* to Sun Tzu's *Art of War*. Miyamoto Musashi (1584-1645) is said to have fought 66 duals to the death and a few wars. Some call him the most legendary samurai that Japan ever knew. At the end of his life he wrote a book where he explains he began a quest for understanding strategy when he was 30. Around 50, he claims to have grasped it and wrote the book a week before his death.

"Language does not extend to explaining the Way (strategy) in detail, but it can be grasped intuitively." -Miyamoto Musashi

This is the connection with tacit knowledge I have been talking about throughout the book. This is why training (as opposed to book reading) and real world experience are needed. Its useful to point out that not all simulations are useful though. Google has claimed that research points out that there is no correlation between GPA and work performance. The reason is that the environment of school requires certain strategies to succeed that don't transfer into the real world.

"I failed in some subjects in exam, but my friend passed in all. Now he is an engineer in Microsoft and I am the owner of Microsoft." Bill Gates

8

"If you merely read this book you will not reach the Way of strategy." Miyamoto Musashi

He points out that we can't become strategists through explicit knowledge alone, we must train and experience the real world. Ancient Rome attributed their success in war and politics not due to a natural superiority of their people, military generals wrote that the Spaniards were stronger, the Germans taller, the Greeks smarter and the Africans fiercer. What made the Romans victorious was their discipline and training. They also kept innovating their weapons, adopting from their conquered enemies.

I once saw a talk from Malcolm Gladwell where he mentioned that on average a Chinese immigrant to the US with an IQ of 100 will have the same level of success as a white American with an IQ of 120. He explains that this is due to cultural differences on how hard they believe they're supposed to work in order to achieve a goal.

An experiment done with Chinese and white American children

was done were both ethnic groups were given a very difficult math problem and had ten minutes to complete it. The Americans quit after 2 minutes, while the Chinese children were still trying to solve the puzzle 15 minutes latter.

This reflects a willingness from the Chinese to keep pushing when things get hard which is a habit created by culture. Gamification should be careful to become a system to remove displeasure. There's lots of value in a fun system, but this should not become an ideology where we shy from uncomfortable situations. As Thucydides said: *"Nor ought we to believe that there is much difference between man and man, but to think that the superiority lies with him who is reared in the severest school."*

Niccolo Machiavelli also warned us in his book *Discourses on Livy* about luxurious societies turning soft which causes their eventual intellectual and civic demise.

"In soft regions are born soft men" -Herodotus

An addiction to pleasure, which is why some in gamification tend to advocate fun, can have negative effects. We have to also acknowledge that many engaging and fun games are hard. What makes them fun and engaging isn't necessarily the game mechanics, but the attitude in which the player engages it. Look up my article on Gco titled *Embracing Paradoxes and Narratives in Education* for a detailed example. The basics of it is this:

A child can assume that their intelligence is either fixed and can't change (a “fixed mindset”) or that they can get smarter by working hard (a “growth mindset”).

A child who has a fixed mindset has a learning disability, brain scans show there's not much brain activity when told a correct answer. The child is timid, and tries not to make a mistake since it will make it believe its not smart. Brain scans show there's a lot of brain activity when he or she is told their answer is wrong.

A child with a growth mindset on the other hand is a learning sponge. Brain scans show that there is little brain activity when they get an answer wrong (which is believed to mean the kid doesn't make failure part of its identity) but flashes with electricity when an answer is correct meaning he or she is learning. Read my article for more details.

In the one hand learning can be made easier by the implicit learning qualities of play, on the other hand don't try to make learning easier by oversimplifying the educational game. Instead of trying to save the kids self-esteem by giving them easy challenges, create a growth mindset and give the student hard ones that maybe even you yourself don't know the answer to. Remember the trend in our entertainment: Both games and TV shows are becoming more and more complex since simplicity is boring to us now, so should it be with education.

A lot of aspects of gamification I believe should reflect sports. It should push a person to their limits with the goal of self-improvement. There should be more sports psychology and less positive psychology.

9

"It is the warrior's way to follow the paths of both the sword and the pen. Even if he has no natural ability in these paths, a warrior is expected to do his share to the best of his ability."
-Miyamoto Musashi

This reflects the need to combine explicit and tacit knowledge. Remember that skills can't scale without the explicit element but explicit knowledge is pointless without the tacit side that is gain through experience.

I think a big motivator for reading is the ability to apply that knowledge immediately into our lives. If you ever started your own business you probably began to read a lot more than usual (which you didn't plan for) because you're frustrated and you're trying to find solutions to your problems.

I don't see a lot of people from my generation reading. Some have literally told me there's no point to it since they can watch TV... just like the comedy act from Bill Hicks with the Waffle

House waitress. One of my friends seemed baffled that Bill Gates would read for 2 hours every night, "Why read when you have all that money" he said.

Most successful people are readers, they have a curiosity about the world. They combine the explicit with the tacit.

10

"The principle of strategy is having one thing, to know ten thousand things." -Miyamoto Musashi

Musashi explains that strategy tends to be a mindset. Its usually a pattern for achieving something. This mindset he claims, can arrive from building a house, doing tea ceremonies or being a swordsman, etc.

If you notice successful people tend to continue to have success in what they set their minds on even if they're unrelated fields. Musashi wrote that since he learned strategy as a swordsman he could learn many different things without the need of an instructor. I think a contemporary example of this is Tim Ferriss. The man is always mastering some new skill or field, writes new book and moves on to something else.

The same can be true from games. From a personal experience I attribute my interest in learning to chess tournaments I

participated in middle school. The first books I read cover to cover were chess books while I was trying to tacitly implement that knowledge on the game. Afterwards I dropped chess and began reading history, philosophy, business, etc and trying to implement that explicit knowledge into my life. But these habits of mind came from my initial involvement in chess.

People who have never succeed at anything tend to just give up. You know they'll make complicated excuses on why something can't be done. Or they'll blame schools for not teaching them something, on and on. Learning how to learn is a skill that can be acquired in games, and then used to learn real-world subjects.

11

"Study strategy over the years and achieve the spirit of the warrior. Today is victory over yourself of yesterday; tomorrow is your victory over lesser men." -Miyamoto Musashi

This quote is very significant to me. It's telling you to do those small things that improve you 0.01% a day and build up over time to make a big difference. It takes about a month to build a new habit and you can only build 2-3 new habits at a time. The only person that can stop you is yourself. You have to be able to do those boring and painful tasks that will push your further.

Life is like a muddy mountain, you can push yourself further, but once you stop you'll start to decline.

"Unless we grow greater we shall become less" Prussian motto after the Napoleonic wars.

12

"Strategy is the art of making use of time and space" -Napoleon Bonaparte

A study by cognitive neuroscientists Mortimer Mishkin and Leslie G. Ungerleider was mentioned in the book *Top Brain, Bottom Brain.* It describes how rhesus monkeys were trained to perform spatial-temporal reasoning tasks (which means they had to control space and time). After the monkeys learned these tasks the doctors surgically operated on their brains. One half had its bottom brain scrambled, the other it's top. What they found was that when the bottom was damaged their temporal skills were lost, when the top was their spatial skills were lost.

So if strategy is the use of time and space (which you can't get from reading a "strategy" book. Its a tacit skill) then to become a superb strategist you must have both parts of your brain operating properly in sync. Now this is where gamification plays its part:

Baylor Wetzel from the University of Minnesota has published some studies on how video games affects our temporal and spatial strategies using the game of tower defence. Here are some highlights of his research:

- When first attempting to solve the spatial-temporal problems it takes the individual 24 attempts, which takes an hour to solve. After that all consecutive attempts in new maps are solved in the first try under 3 minutes. Players learned how to reason better, it's a tacit change.
- Computers have excelled humans in many tasks, but complex tasks using spatial and temporal reasoning such as those used in the game of Go or real-time strategies are still dominated by us humans. (remember that we humans are pattern-based intelligence while computers are information-based intelligences. This makes us better at dealing with complexity by creating innovative strategies).
- Novices tend to focus on spatial strategies, experts on temporal ones (Napoleon Bonaparte focused more in the use of time than on space).

So we know games improve the synchronization between top and bottom brain since its a requirement for playing games. It might be that a reason why games increase strategic ability in the real world is by giving it a cognitive workout and improving the communication between both brain regions, and making the mental mode of a "Mover" (using both parts of your brain) a

habit of mind.

A great example of a serious game that I believe gives spatial-temporal reasoning for a specific area of business comes from a company called SCM Globe. This is a supply chain management simulator. In it the student has to think about the spatial problem by locating facilities such as warehouses and factories across a supply chain, along with the temporal skill of choosing the right location due to distance-time relations or taking into account transportation vehicles.

All the while the students are doing the exact math and analysis that will be used in his career to manage a company's logistics, which gives them domain-specific patterns in their long-term memory.

But another basic aspect of strategy is the ability to find the interrelationships between agents in a system. These include the physical objects, the people, the relationships between people and the culture (Snowden explains that narratives and myths are more important than people in influencing a system). Charles Hill argues that these connections can be made through reading literature, I agree with this statement, but will expand to it.

One of my favorite examples of an educational game comes from

the teacher John Hunter. Search for his TED talk, its amazing. He develop a game for elementary children (that's now also being used by high schools) called the World Peace Game. 25-30 students play the game at a time, they pick 4-5 fictional countries which have different resources. The object of the game is to solve several real world problems (Nuclear proliferations, water rights, cultural disagreements, saving endangered species, etc) while the goal being that everyones GDP increases at the end of the game along with solving these problems. .

The game is really complex, the children play different roles, there's secret documents being passed around, they have to decide if they want to make war or peace, who to ally with, if they should create a preemptive strike, etc. Every time a general (one of the kids plays this role) loses one of his military units he has to make a fictional letter to the imaginary parents of that lost soldier. The kids then explain that this shows them that even if they win, there's costs for going to war.

This is a great example on how to use emotions with learning. Another mistake from the Age of Enlightenment (that caused the revolt of the Romantic period) is the belief that emotion stands in the way of reason. In some contexts yes, too much emotion can cloude you, but having none is just are disastrous. If you don't have emotions, you don't know what to love and what to hate, you're handicapped and have a very hard time making decisions.

John Hunter allows the children to run the classroom when they're playing. He explains that their collective intelligence is greater than his. He gives them a problem (like water rights) and expects them to solve it while he himself doesn't known how its going to be done. This is an example of a non-linear game emerging through the rules of the game. No two games are ever the same. The teacher isn't mechanically running the class, the kids are, and an organic pattern of learning emerges.

This method is very significant since it creates whole brain learning. Children are learning social skills, which develops theory of mind. They have to know if another team of kids are trying to trick them, or how to trick them back.

There's a theory in psychology called distributed cognition (which Snowden uses in enterprise) which I think is useful in the gamification community. Its the idea that intelligence is not only held individually but as a group and the surrounding environment. Remember how Ann Pendleton-Jullian said that her students began designing successful games only when they worked as a group, and that this came about from the tacit knowledge that had been developed.

This I believe is why John Hunter intuitively allows the kids to solve problems on their own in teams. Complex problems seem better being solved as a group, but we have to also recognize that groupthink and its disastrous herd mentality can take place.

There's techniques to avoid that I won't discuss, but its good to be aware of that they exist.

Finally one thing that really impressed me was that John Hunter was reading to 9 year old kids verses from Sun Tzu's *Art of War* and the kids are understanding it. Remember how I said that explicit knowledge needs to be tacitly understood? The game is giving them a tacit knowledge to understand the explicit knowledge of Sun Tzu, and this explicit knowledge amplifies their skills in the game. If you think about it, most military officers haven't read Sun Tzu until they've join the war college, and John Hunter has devised a method for 9 year old children to understand the book through a platform of play.

I think that's very significant and shows how games will improve the reading of literature and how-to books if they can be connected with gameplay. And once they've learned how to learn they'll apply it into their lives.

One final note: Jane McGonigal points out in her research that there's a point of diminishing return were video games will make children stupid. This means that is children are already playing video games at home, no matter how ingenious a game-based learning program with video games is, they'll always have harmful benefits due to the digital habits of children outside school. This is why for educational purposes we should be focusing less in video games and more in live games as the one

just described.

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“Design Thinking” is another buzz word in business (not as big today). Its now being said that solving problems in business should be approached as a designer. As Ann Pendleton-Jullian credibly argues, design thinking is learned in a tacit level by designing actual games and one can argue that distributed cognition plays a big role.

Tim Brown, the CEO and president of the legendary global consulting company IDEO who has been ranked amongst the top ten innovative companies in the world is a very big advocate of design thinking. He explains that design thinking is creating a shift from companies having a passive relationship between producer and consumer into the active engagement of everyone in ways that are meaningful, productive and profitable.

Tim argues that design thinking is not only about products but becomes “participatory systems.” He explains that intangible forms of value beyond simply cash will begin to be the major characteristic of not only design, but of our entire economy as we move forward.

Think about how this applies to the 4 rewards Gabe Zichermann attributes a gamification should have which he calls SAPS. In

order of importance:

1. Status
2. Access
3. Power
4. Stuff

Gabe explains that stuff is the last resort because it can be measurable. If its measurable, people make cost-benefit analysis and won't get as excited. Stuff could be giving away a $30 concert ticket. If on the other had someone gets a chance to have backstage access to their favorite band, this can't be measured and is a lot more valuable to the "player" when they can't put a price on it.

In this case gamification is subtle, it's just a tweak of the current "participatory system." This makes gamification not a niche market, but applicable to almost any business model.

Conclusion

The objective of this book has been to find the evolutionary connections between play and learning and link it to our modern business world. Play emerged has an evolutionary property for us to learn implicitly and tacitly the complexities of the world. As we tacitly understand how to navigate, manage and design

complex systems we become better problem solvers, which is the essence of strategy. This process will make us more dangerous in the corporate world.

As we link gamification with design thinking we can begin to appreciate a whole new world of applications. Ultimately it will help us build better tools for education and enterprise while making us smarter in the process. Not only will it enrich us individually with a better education profits, but it may be a tool for the survival of our social structure.

There are many credible authors that are arguing that a collapse of our society is inevitable since it seems to be a law for complex societies to fall apart (read Joseph Tainter, avoid Jared Diamond). This they claim, is an inevitable result of built up complexity. But this is not necessarily a modern idea: Edward Gibbon gave his interpretation in his book *The Rise and Fall of the Roman Empire.* Oswald Spengler his in his book The *Decline of the West.* Our modern world is far more complex than what these writers talked about and we're still thriving.

Our brains are already naturally adapting to complexity through our entertainment, gamification could be a tool to amplify this process. Damon Horowitz is openly claiming that technologists should incorporate the humanities into their design thinking. Problem solving is becoming multi-disciplinary, collaborative and complex.

John Hunter showed us that a teacher with love for his students can develop a game that will get 9 year old children quoting Sun Tzu and solving complex problems collectively. Gamification can benefit us by:

a) Rewiring our brains to understand, manage and design complex systems

b) Create communication platforms where we can better operate and organize ourselves through technology.

Will this make the world "a better place"? Such an answer is completely subjective. What it will probably make is a more interesting one though. That should be reason enough to move forward with it.

"*Boredom is a disease* worse than cancer." *Doug Stanhope*